Pander Society Newsletter

Compiled and edited by M.C. Perri, M. Matteucci and C. Spalletta

DIPARTIMENTO DI SCIENZE DELLA TERRA E GEOLOGICO-AMBIENTALI, ALMA MATER STUDIORUM-UNIVERSITÀ DI BOLOGNA, BOLOGNA, ITALY

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Chief Panderer's Remarks July 8, 2010

Dear Pander Society people,

It is again summer and I am at the end of the first year in a new role—since ICOS 2009 in Calgary when the honour of Chief Panderer was bestowed upon me. I am much honoured to be the first woman to have this honour bestowed on her.

As I wrote in my first communication to all Panderers, it was with a sense of awe that I accepted this task — to attempt to follow in the footsteps of a remarkable sequence of Chief Panderers who gave so much time to improving communication between conodont workers around the globe. I thank very much Peter von Bitter for the excellence of the job he did during his tenure, superbly keeping "all of the Panderers connected and in harmony". A special thanks to Peter also for the help he offered me during this year, and hope he will excuse me for 'plagiarising' some parts of his previous beautifully crafted newsletter. Many thanks too for the help that other Panderers have offered me.

My previous role as member of the Committee for deciding Pander Society Medal has now passed to Susana Garcia Lopez (University of Oviedo, Spain). I thank very much the other two members of the Pander Society Medal Committee, John Repetsky and Wang Cheng-yuan, for their genial collaboration during past years on the Committee. They will continue in this role.

Generating my first newsletter proved a major exercise in extracting reports from reluctant conodont colleagues—only about 50 % responded (many thanks!), despite repeated badgering. Claudia Spalletta helped me, as did Myriam Matteucci who was an old friend at the lyceum and university where we followed courses, studying and facing exams together. I thank both of them for helping bring this newsletter to fruition. I am also very grateful to Mark Purnell, our very capable webmaster at the Leicester end of this operation.

In the past year we have lost four of our great conodont researchers and personalities: Tanya Klets, Maurits Lindström, Klaus Müller, and Yevgeny Aleksandrovich ('Zhenya') Yolkin. We remember them for their massive contributions to our science and for their genial interaction with us.

Four meetings featuring conodont research were organised during the 2009 and two in 2010; notes about them can be found in the newsletter as well as notification about future events that will involve Pander Society members presenting material of interest to us.

Welcome and best wishes to the 5 new entries, Damon Bassett, Martyn Golding, Fred Rogers, George D. Sevastopulo and Satoshi Takahashi as members of the Pander Society!

I thank very much in advance all of you who propose to inform me about events involving conodont workers; these events will receive notice be in the next newsletter 2011. Please send me brief notes about them for the newsletter!

I wish all of you exciting research results during the coming year!

Cristina

M. Cristina Perri
Chief Panderer

Maria Cristina Perri, Chief Panderer, Alma Mater Studiorum-Università di Bologna, Dipartimento di Scienze della Terra e Geologico-Ambientali, Via Zamboni 67, I-40126 Bologna, Italia, Tel. 0039 051 2094560, Fax 0039 051 2094522, e-mail: mariacristina.perri@unibo.it

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In Memory

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Maurits Lindström,

Klaus Müller,

Yevgeny Aleksandrovich ('Zhenya') Yolkin.

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Tanya V. Klets

In February 2010, Tanya Klets (Novosibirsk University, Russia) died of cancer; she was aged about fifty. She produced about 20 publications on the taxonomy and biostratigraphy of Triassic conodonts, especially gondolellids, from various localities dotted from the Russian Arctic (Kotel'niy Island) almost to Vladivostock in the Russian Far East. Her identifications of conodonts from sparse limestones in the Devonian of the Russian Far East helped provide a measure of precision on the ages of the great clastic sequences of that area whose strongly provincial (Mongolo-Okhotsk Province) brachiopod faunas had always been tantalisingly imprecise as regards ages. She was a shy person who avoided the limelight. Her most important work was a major monograph on the Triassic conodonts of central Sikhote-Alin (between Vladivostock and Khabarovsk) published by the Novosibirsk State University in 1995.

John A. Talent

Maurits Lindström

With Maurits Lindström's death from cancer and pneumonia on November 14, 2009, international conodont research lost one of its most prominent workers. Born in Stockholm in 1932, Maurits started his illustrious research career already as a high school student and published his first scientific paper, in which he described several new fossil species and the stratigraphy of a part of the Katian (Upper Ordovician) succession in the Fågelsång area east of Lund, at the age of 21. Maurits began his formal academic studies at Lund Univesity in 1950 but he attended geology lectures there already in the late 1940s. He pioneered modern conodont research in Baltoscandia with two papers published in the early 1950s, one of which is the now classical study on the Lower Ordovician conodonts of south-central Sweden, which appeared in 1955 and established Maurits as an international authority on this group. These diverse Lower Ordovician conodont faunas had remained essentially unstudied since Pander's (1856) time and Maurits' monograph, in which he introduced 9 new genera and 60 single element species, has remained an indispensible source of information more than half a century after its publication. In the early to mid-1950s he also did very extensive structural work in the Caledonides of northern Sweden, which was summarized in his Ph.D. dissertation that was published in 1958. During the late 1950s, Maurits published papers on conodonts in shales and cherts in Sweden and Scotland, and he also assembled a huge collection of Lower and Middle Ordovician conodonts from southern Sweden that formed the basis of a paper presented at the International Geological Congress in Copenhagen 1960.

Apart from periods of being Visiting Professor in Bonn in 1964 and in Columbus, Ohio in 1965, Maurits was associated with Lund University up to 1967 when he became Professor and Chair of the Geology Department at Phillips Universität in Marburg, Germany. As shown by his publication list (Bergström et al., 2007), during his years in Lund Maurits published more than 30 articles on conodonts, tectonics, sedimentary structures, and stratigraphy. His book "Conodonts," which was published in 1964, confirmed his position as a world authority on conodonts. Its long-range impact, especially in terms of taxonomy, probably suffered from the fact that this book appeared just before the introduction of multielement taxonomy. However, together with the Conodont Treatise and Sweet's conodont book, it remains the best general summary of our knowledge about conodonts published to date.

He continued very active conodont research during his years in Gemany. Particularly notable papers deal with the affinities of conodonts, the function of the conodont apparatus, conodont provinciality, and conodont supragenetic classification and paleoecology. The Lower Ordovician conodont biostratigraphy for Baltoscandia introduced by him in 1971 is with minor modifications still in use. His conodont research also comprised descriptions of about 25 conodont genera and numerous species in Ziegler's "Catalogue of conodonts" and contributions to the conodont part of the "Treatise on Invertebrate Paleontology." With Ziegler, he also published several papers on the microstructure of conodonts.

After his return to Sweden in 1984, his research interests shifted from conodonts and sedimentology to other geological research fields, but he maintained an active interest in Ordovician conodonts as shown by the fact that during his Stockholm years, he supervised several graduate student thesis and dissertation projects that wholly or partly dealt with conodonts. From the late 1980s to his untimely death, his research was mainly focussed on meteorite craters and cratering, a field in which he published some 30 articles that made him an internationally known impact crater expert.

Maurits' conodont work, which includes some 35 papers and his conodont book (see Bergström et al., 2007 for a list of publications), represents a major contribution of lasting value to our knowledge about this group. He was an active participant in the Symposium on Conodont Biostratigraphy in Columbus, Ohio in 1969, was co-organizer of the Symposium on Conodont Taxonomy in Marburg, Germany in 1971, and participated in the symposia on Conodont Paleoecology in Waterloo, Ontario in 1975, Conodont biofacies and Provincialism in Madison, Wisconsin in 1983, and Conodont Palaeobiology in Nottingham, United Kingdom in 1985. As far as I know, he did not attend conodont symposia after 1985, but he kept current on conodont research and remained internationally highly respected among conodont workers.

He is sorely missed by his many colleagues and friends around the world, who admired his brilliant intellect, his ability to speak and write several languages, his extraordinary powers of observation (especially in the field), his ability to master an exceptionally wide range of geological specialities, and his ability to find novel and unconventional but logical interpretations of geological phenomena. Personally, he was a friendly, helpful, and honest person, who rarely dominated a gathering. He enjoyed discussing geological problems and freely offered his own interpretations based on his encyclopedic knowledge about many fields of geology. With his death, international conodont research has lost one of its all-time greats, and it is safe to predict that his work will continue to have a profound influence far into the future.

Reference

Bergström, S.M., Bergström, J., Kumpulainen, R., Ormö, J. and Sturkell, E., 2007. Maurits Lindström---A renaissance geoscientist. GFF, v. 129, pp. 65-69.

Stig M. Bergström

Klaus Müller

Klaus Müller (Berlin 6.02.1923 – Bonn 12.03.2010) made many important contributions to the study of conodonts during the rennaissance period of the 1950's and 1960's but turned to other interests later in his career. He was the recipient of the Pander Society Medal about a decade ago.

I include copy of an announcement sent by Dieter Waloszek announcing his death.

Raymond L. Ethington

It is with deepest sadness to tell you that on Friday 12, 2010, our dearest colleague and friend, discoverer of the Orsten, Klaus J. Müller, passed away peacefully in his home in Bonn, age 87. A little cold may have caused that his weak heart could not work anymore.

Until last, Klaus was not only interested in many things but he was even working hard on a book on gemstones, his main and long-lasting hobby over the past.

We all have benefitted so much from Klaus' great scientific work and likewise knowledge, and we are very grateful that he could have been around supporting us for so long.

Thank you so much, Klaus, for a wonderful time together!

Evgeny A. Yolkin

After a prolonged illness, Evgeny Aleksandrovich ('Zhenya') Yolkin (29.01.1934–29.12.2009), 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 insight 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.

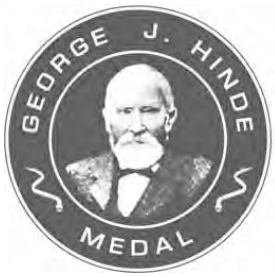
Long before he died, Zhenya had become Russia's leading Devonian worker. In 1974 he had become a foundation titular member of the Subcommission on Devonian Stratigraphy (SDS) of the International Commission on Stratigraphy. He had also been an active member of the Ordovician and Silurian subcommissions, 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.A.Talent, N. Bakharev, N. Izokh, T. Kipriyanova, O. Obut, N. Sennikov

The Pander Society Medal & the Hinde Medal for Young Conodont Researchers



Please forward your nominations for the Pander Society Medal & the Hinde Medal for young conodont researchers to any of the three members the Pander Society medals committee consisting of (chair) John Repetski jrepetski@usgs.gov, Susana Garcia Lopez sgarcia@geol.uniovi.es, and Cheng-yuan Wang cywang@nigpas.ac.cn. The committee urges Society members to consider possible worthy candidates, and to formulate and submit nominations for deserving colleagues. Nominations can be submitted at any time.

Prof. Giovanni Gabbianelli, Head of the *Integrated Geoscience Research Group* (I.G.R.G.) (http://geologia.ambra.unibo.it), part of the Interdepartmental Center of Environmental Sciences (CIRSA) of the University of Bologna, has generously offered 1000 € as a contribution for the next awards.

Thank you

The Pander Society thanks the University of Leicester for permitting the Newsletter to be distributed from their webserver.

Business Meeting of the Pander Society at the International Conodont Symposium (ICOS) 2009, University of Calgary, Calgary, Alberta, Canada

A business meeting of the Pander Society was held on Thursday p.m., July 16, 2009, with Chief Panderer Peter von Bitter Presiding

Pander Society Thank you
The Chief Panderer, on behalf of the Pander Society, thanked Charles Henderson and the University of Calgary for his/their hospitality, and for organizing a most interesting and successful international conodont symposium; he further remarked that he was particularly happy with the fine organization of this first international conodont meeting outside of Europe and the U.K, and with such a good international attendance.

ICOS 2013
Guillermo Albanesi volunteered to host the next international conodont symposium, ICOS 2013, in Argentina, an action endorsed and applauded by the Pander Society members present; Guillermo stressed that he would seek the help of other South American colleagues in organizing this symposium & related field trips, and that he looked forward to welcoming all Panderers to South America in 2013. The Chief Panderer thanked Guillermo for stepping forward and taking on this responsibility; he also noted that ICOS, the International Conodont Symposium continues its international journey!

Hinde Medal
The Chief Panderer spoke about the Hinde Medal, the Society's relatively new award for outstanding & promising young conodont researchers; he explained that the timing between conception of the award by him, and its first presentation in 2006, was both short and time driven by the fact that some of candidates for the medal weren't quite so young anymore; in effect, they were burdened by a best before date. Thus, the award was made, even though an actual medal still needed to be designed and cast, and resulted in Mark Purnell, our first Hinde medallist, having to remain medal-less for the next three years.
The Chief announced the welcome news that a medal has been designed by Canadian designer and artist Mary Anne Collins (of *Wonderful Life* & Burgess Shale fame), and that a prototype medal cast in pewter/?zinc would be awarded that evening to our second Hinde medallist, Sachiko Agematsu of Japan, and retroactively to our very patient Mark Purnell of Great Britain (see picture).

The Chief Panderer thanked the Medal Selection Committee, John Repetski (chair), Cheng-yuan Wang, and Maria Cristina Perri for their longstanding & conscientious service to the Society.

Funds

Although the Pander Society is an informal society, without an operating budget, occasionally there is the need for actual money. Thus, at the business meeting in Calgary, the Chief Panderer identified a need for financing the design, casting and stocking of the Hinde Medal, as well as paying for Pander Society medals to be cast, stocked and inscribed. [He is pleased to report (after the fact) that the costs for the Hinde Medal have/will be borne by Ronald Austin, Lennart Jeppsson, and himself; present and some future Pander Society Medal costs were/will be borne by generous donations from Christopher Barnes, Alexander (Sandy) McCracken, Godfrey Nowlan and himself. Viva les Canadiens!]

New Chief Panderer

Because the present Chief Panderer's five year term is up in the summer 2009, an international selection committee of Jeffrey Over, Phillip Donoghue and Catherine Giraud convened early in 2009, to find a new Chief Panderer. After a thorough search, and after some slight agonizing, the chosen individual graciously agreed to serve. This allowed the outgoing Chief Panderer to announce Maria Cristina Perri of the University of Bologna as our new Chief Panderer for the next five years. The outgoing Chief Panderer, and the Pander Society members present, applauded this choice; not only is Cristina our first woman Chief Panderer, but she also our first Chief from a non-English speaking country! A superb and wise choice, indeed!

Peter von Bitter, (then, still) Chief Panderer

2009 Pander Society Medallists

During the ICOS 2009, two renowned Panderers, Peter von Bitter, former Chief Panderer, and Christopher Barnes (right), who distinguished themselves by major contributions to understanding of the Conodonta, by the special way in which they encouraged young workers, and by their professionalism, dedication and humility, were awarded Pander Society medals. Hearty congratulations to both of them and best wishes for long and highly productive future.

Cristina
Chief Panderer

Becoming a Part of Con-nexus

Con-nexus is a free e-mail forum for the rapid exchange of ideas and information concerning conodonts and conodont research. **To subscribe**, go to http://lists.le.ac.uk/mailman/listinfo/con-nexus and enter your details. **To post a message** to all other members of con-nexus (only subscribers can post), address it to: con-nexus@lists.le.ac.uk. **To unsubscribe** go to the following webpage and enter your details: http://lists.le.ac.uk/mailman/listinfo/con-nexus. This page also contains other useful information, such as how to access archives, and change your subscription information and settings.
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Happy News

The Chief Panderer extends her, and the Pander Society's, congratulations, best wishes and happiness to Sandra Kaiser and Gregor, the youngest Pander Society Member, born last 10th of May.

Miscellanea

Michael (Mike) Murphy wrote to the Chief Panderer the following letter. "It occurred to me that we panderers don't really use our "organization" as effectively as we could, especially with respect to the huge volumes of material that have been collected on the many excursions sponsored by the Pander Society. Much of this material goes into someone's collection for reference, but never sees the light of day afterwards. I personally am in the process of putting on line all of my collections, in many cases I have photographed entire samples, but will never publish the work. For instance, I have photographed the Lower Devonian collection of Lane and Ormiston, 1979 (that did not appear in their paper) for my personal use. I'm sure others have done similar exercises, but this never becomes a resource for anyone else. Wouldn't all of our work be more securely grounded if we had access to this hidden resource and shouldn't the Chief Panderer promote this?"
It seems a good idea. Who of us offers his energies for assembling the material rolling in?

The Chief Panderer

Attention Devonian–Carboniferous boundary Researchers

We feel that the time is appropriate (22 years since publication of Courier Forsch.-Inst. Senckenberg 100 devoted to D-C boundary sections and problems around the globe) to request conodont workers who may have potentially instructive D-C boundary sequences to consider undertaking intensive re-sampling of their sections at smallest practical intervals in order to contribute to producing the best possible global picture of what happened in conodont evolution and biogeography through the critical D-C interval including the Hangenberg Event. Such an initiative should include old candidate GSSP sequences in Europe, the former Soviet Union and China such as Gruene Schneid, Berchoguer (Kazakhstan), Nanbiancun and Dapoushang and new spectacular sections not yet known to the scientific community.

Please, send the results of your research to Markus Aretz, Université de Toulouse, France, Leader of the Devonian–Carboniferous Boundary Task Group (e-mail: aretz@lmtg.obs-mip.fr).

The Chief Panderer

Past Meetings

June 4-11, 2009, Time and Life in the Silurian: a multidisciplinary approach joined with the Subcommission on Silurian Stratigraphy Field Meeting 2009, Sardinia, Italy

The International Subcommission on Silurian Stratigraphy Field-Meeting 2009 was held in Sardinia (Italy). The meeting consisted of three days of scientific communications in the seaside village of Villasimius, in the southeastern part of the island, followed by a four days field trip in southern Sardinia.
More than fifty scientists from fifteen countries attended the meeting. The scientific session was filled with talks dealing on any aspect of Silurian stratigraphy and palaeontology; the poster session included 18 posters. A few contributions focused on conodont biostratigraphy, mainly across the Silurian/Devonian boundary, whereas several others reported conodont data. The abstract book is downloadable from the meeting web site (*www.unica.it/silurian2009*). One afternoon was dedicated to an ISSS business meeting.

A proceedings volume including eight papers has been published in a special issue of *Bollettino of the Società Paleontologica Italiana*. A pdf file of all contributions will be downloadable from the meeting web site (*www.unica.it/silurian2009*).

Several sections and localities, representing a good summary of the Silurian of Sardinia, were visited in the field trip. These localities have been selected either for their historical relevance or the amount of available data. Furthermore, to better understand the Silurian successions of Sardinia, also one Hirnantian locality and two Lochkovian outcrops were shown. The first two days of the trip were devoted to the well exposed, almost continuous sections of the External Nappe Zone (southeastern Sardinia); then the excursion participants moved to the External Zone (southwestern Sardinia), where the Silurian outcrops are less impressive, but the fossiliferous content is in general more exciting. Historical sites and an old mine gallery were visited, too.

In connection with the meeting, three volumes were published in the series *Rendiconti della Società Paleontologica Italiana*:

1. **The Silurian of Sardinia -** Corradini C., Ferretti A. & Storch P. (Eds), 170 pp.

The volume is dedicated to Prof. Enrico Serpagli to celebrate his more than 40 years of activity in the Lower Palaeozoic of Sardinia. The first part of the volume comprises seven contributions introduced by an historical overview of studies already carried out on the Silurian faunas of Sardinia. It aims to delineate a comprehensive scenario of the Silurian of Sardinia within a proper geological setting. A global overview regarding the palaeoenvironment and palaeogeography is also provided. The second part of the volume consists of seven research papers that illustrate actual knowledge on major fossil groups encountered in the Silurian limestones and shales of southern Sardinia.

Contents of The Silurian of Sardinia volume:

Foreword

P. STORCH, A. FERRETTI, C. CORRADINI - Enrico Serpagli, celebrating his 44th Silurian-research birthday

S. BARCA - The Silurian of Sardinia (Italy): more then one and half century of researches

A. FUNEDDA, G. OGGIANO - Outline of the Variscan basement of Sardinia

G. OGGIANO, P. MAMELI - Silurian and its surroundings in the inner nappes of Sardinian Variscides: Lithostratigraphical evidence from metamorphosed deposits

C. CORRADINI, A. FERRETTI - The Silurian of the External Nappes (southeastern Sardinia)

C. CORRADINI, M.G. CORRIGA, A. FERRETTI, F. LEONE - The Silurian of the Foreland Zone (southwestern Sardinia)

A. FERRETTI, P. STORCH, C. CORRADINI - The Silurian of Sardinia: facies development and palaeoecology

A. FERRETTI, G. OGGIANO, C. CORRADINI, P. STORCH - Silurian Palaeogeography of northern Gondwana: where was Sardinia at that time?

P. STORCH, S. PIRAS - Silurian graptolites of Sardinia: assemblages and biostratigraphy

M.G. CORRIGA, C. CORRADINI, A. FERRETTI - Silurian conodonts from Sardinia: an overview

M. GNOLI, P. SERVENTI - Silurian nautiloid cephalopods from Sardinia: the state of the art

J. KRIZ - The upper Silurian Bivalvia dominated palaeocommunities succession of southwestern Sardinia – correlation with Perunica and the peri-Gondwanan regions of Europe

P. PITTAU, M. DEL RIO - Chitinozoan assemblages and biostratigraphy of the Silurian of Sardinia

M. GNOLI, V. PERRIER, P. SERVENTI - The state of researches on Silurian Sardinian Crustacea

C. CORRADINI, M. DEL RIO, M. GNOLI, P. PITTAU - Minor fossil groups in the Silurian of Sardinia

2. **Time and Life in the Silurian: a multidisciplinary approach - Field Trip Guidebook -**Corradini C., Ferretti A. & Storch P. (Eds), 96 pp.

A brief geological and stratigraphical overview of the Silurian of Sardinia introduces to the excursion itinerary with locality descriptions.

Contents of the volume:

Foreword

C. CORRADINI, A. FERRETTI, P. STORCH - The Silurian of Sardinia: introduction to the field trip

S. PIRAS, P. STORCH, P. PITTAU, M. DEL RIO - The Lower Graptolitic Shales at Rio Minderri and Rio Brabaisu-Rio Ollastu confluence (Rio Ollastu area, Sarrabus, SE Sardinia)

P. STORCH, S. PIRAS, M.G. CORRIGA- Wenlockian graptolites and the Lower Graptolitic Shales-Ockerkalk transition East of Lantini Tunnel near Ballao (SE Sardinia)

S. PIRAS, F. PASCHINA - The Lower Devonian Upper Graptolitic Shales in the Sa Ruinosa Section (SE Sardinia)

P. STORCH, S. PIRAS, P. PITTAU, M. DEL RIO - The historical section of Goni (Lower Graptolitic Shales, SE Sardinia)

P. STORCH, S. PIRAS - Lower Telychian graptolite fauna in Sedda de S'Ortu Section (Lower Graptolitic Shales, SE Sardinia)

C. CORRADINI, A. FERRETTI, M.G. CORRIGA, E. SERPAGLI - The reference section of the Sardinian Ockerkalk: the Silius Section

C. CORRADINI, A. FERRETTI, M.G. CORRIGA, E. SERPAGLI - Loboliths (crinoids) and conodont biostratigraphy of the Genna Ciuerciu Section (SE Sardinia)
F. LEONE, A. LOI, G.L. PILLOLA, P. STORCH - The Late Ordovician (Hirnantian) deposits in the Domusnovas area (SW Sardinia)
P. STORCH, S. PIRAS - Lowermost Silurian graptolites in Monte Cortoghiana Becciu (Genna Muxerru Formation, SW Sardinia)
G.L. PILLOLA, A. FERRETTI, M.G. CORRIGA, C. CORRADINI - Highly tectonized Silurian and Lower Devonian sediments at Funtanamare (SW Sardinia)
A. FERRETTI, C. CORRADINI, J. KRIZ, S. PIRAS, E. SERPAGLI - The Perd'e Fogu outcrop: a classical exposure of "*Orthoceras* limestone" in the Fluminimaggiore area (SW Sardinia)

3. **Time and Life in the Silurian: a multidisciplinary approach - Abstracts -** Corriga M.G. & Piras S. (Eds), 100 pp.
The volume includes the forty-seven abstracts of talks or posters presented at the meeting. The pdf of the volume is available in the meeting web page (*www.unica.it/silurian2009*).

Copies of the three volumes are still available. The complete set of three volumes cost 45 € (+5 € for shipping expenses). Each volume costs 20 €.
For orders and payment details please contact *silurian2009@unica.it*

(submitted by Carlo Corradini)

July 12-17, 2009, International Conodont Symposium (ICOS) 2009, University of Calgary, Calgary, Alberta, Canada

ICOS 2009 included 84 registered participants from 14 countries, with 56 papers and 20 posters presented over four days of sessions (see titles & abstracts below). The meeting began in the afternoon and evening of July 12th with an ice-breaker of generous liquid refreshments, abundant food, and many renewals of friendship, in the Rozsa Centre. We began the scientific sessions on July 13th, a cool, wet day, with a morning session on Devonian conodonts chaired by D. Jeffrey Over, and an afternoon session on Carboniferous conodonts chaired by long-time conodontologist Carl Rexroad. On the 14th we learned about conodont geochemistry and other general topics in a session chaired by Mark Schmitz, and in the afternoon on Permian conodonts chaired by Shilong Mei. We took a day off from sessions on July 15th and many visited the Royal Tyrrell Museum of Paleontology at Drumheller on a trip led by Godfrey Nowlan. Participants on this visit enjoyed some fine Badlands scenery and excellent fossil displays at the museum, especially of post-conodont Dinosauria. Others stayed in Calgary and enjoyed looking at conodonts at a workshop in my research laboratory. Some were able to check out specimens on a tabletop SEM, which was on display courtesy of Hitachi. I sacrificed a number of elements (potential apparatuses) to Jeff Over so that he could feed them to fish! Thursday July 16th was an exciting day as we had a session in the morning chaired by Mark Purnell on Conodont Function and Paleobiology – during this session Mark appeared to suggest on the basis of tooth complexity that conodonts may have been vegetarians; wishful thinking on his part perhaps, but it stimulated considerable discussion that will no doubt have continued at IPC3 in London in late June 2010. We also saw some fascinating 3D animation of an apparatus of *Novispathodus* produced by Nick Goudemand and colleagues. During the afternoon, I chaired a short session entitled Lagerstätte and Paleobiology that included presentations by three renowned conodontologists Chief Panderer Peter von Bitter, former Chief Panderer Dick Aldridge, and Chris Barnes.

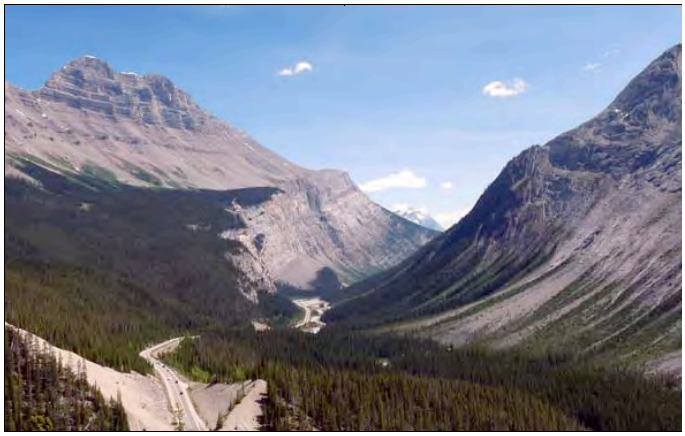
This was followed by a Pander Society Business Meeting chaired by Chief Panderer Peter von Bitter.

ICOS participants assembled in the Calgary sunshine

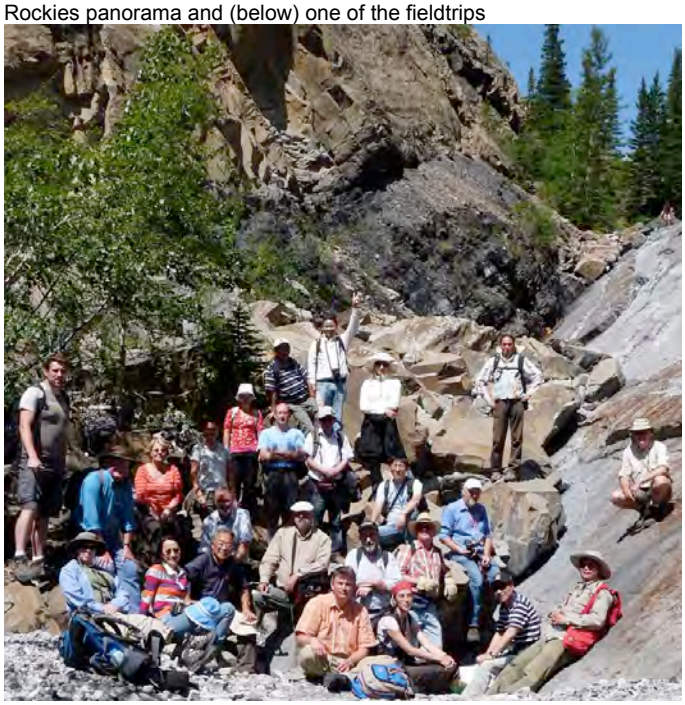
Les Canadiens (mais sans Henderson): Barnes, McCracken, von Bitter, Nowlan.

On Thursday evening, we all took a bus to a western barbeque at the Kananaskis Guest Ranch, with its outstanding views of the Front Ranges of the Southern Canadian Rocky Mountains. The peace and tranquility of the lovely summer evening was interrupted by an entertaining old west gunfight in which Chief Panderer Peter von Bitter barely escaped with his life at the hands of some bad dudes, real western Canadian vigilantes, that still roam that wild part of western Canada. Fortunately, Peter recovered sufficiently to experience and appreciate long time colleague and friend Glen Merrill award him the Pander Medal on behalf of the Society for his many collaborative conodont studies over the years and for his service to the Pander Society, and to see colleague Christopher Barnes presented the Pander Medal by his former student Godfrey Nowlan, for Chris' long and exemplary work on our favourite fossil group. Sachiko Agematsu of Tsuksuba University in Japan, nominated by John Talent of Australia, was subsequently awarded the 2009 Hinde Medal by the Chief Panderer, both for her already outstanding productivity, as well as her great promise as a young conodont worker. Mark Purnell was retroactively presented with the actual, physical Hinde Medal from the Chief Panderer; this resulted from the fact that when Mark was awarded the first Hinde Medal at ICOS 2006 in Leicester for his always inspired conodont work, the medal had yet to be designed & cast.

On Friday we started with the oldest conodonts in a session chaired by Stephen Leslie on Cambrian to Silurian conodonts and finished with the youngest (prior to the most tragic of the big 5 extinctions) in a session on Triassic conodonts chaired by Mike Orchard. During the meeting there were also official business meetings of the Subcommissions on Carboniferous Stratigraphy and Permian Stratigraphy, ICS.



Rockies panorama and (below) one of the fieldtrips



We also had three fieldtrips during the meeting including a pre-meeting trip to the Middle Cambrian Burgess Shale Lagerstätte led by myself on a sunny July 11 and a post-meeting trip to the Burgess Shale July 18 led by a student David Terrill. I also led a four day, sold-out post-meeting Rocky Mountain fieldtrip with the expert co-leadership of Barry Richards and David Johnston. We enjoyed some fine weather, fantastic scenery, and excellent sequence biostratigraphic discussion, as well as two lovely evenings at the Banff Centre resort and one evening in Jasper, Alberta. I received many excellent comments from participants. The abstract volume and the Rocky Mountain fieldtrip guidebook can be downloaded at http://www.ucalgary.ca/conodont/icos.

I would like to especially acknowledge and thank Tim Fukami and Charity Derksen of the University of Calgary Conference and Events Services for their

help; this meeting would not have been the very successful & enjoyable meeting it was, without these two individuals.

It was my pleasure to host ICOS 2009 and I hope everyone who attended enjoyed some fine western hospitality and found the discussion during and after sessions stimulating. I wish everyone success with their research, and hope to see you all at ICOS 2013 in South America.

(submitted by Charles Henderson, Chairman, ICOS 2009)

Abstracts of the International Conodont Symposium (ICOS) 2009 at the University of Calgary, Calgary, Alberta, Canada Website: http://www.ucalgary.ca/conodont/icos

Silurian to Early Devonian conodonts from Malaysia and Thailand
Sachiko Agematsu and Sashida Katsuo

Conodont biostratigraphy and paleoenvironments of the lower Sierra de La Invernada Formation, Middle Ordovician, San Juan Precordillera, Argentina
G. L. Albanesi, A. M. Bejerman and R. A. Astini

The composition and architecture of primitive prioniodontid conodont apparatuses; a state-of-the-science review
Richard J. Aldridge

Conodonts and the end-Devonian event stratigraphic chronology in the classic Pennsylvania "Oil Lands" region: Latest Famennian Riceville Formation – Berea Sandstone succession
G.C. Baird, D.J. Over, J.S. Sullivan, S.C. McKenzie, J.C. Schwab and K.A. Dvorak

The fossil record from Pizzo Mondello (Sicani Mountains, Sicily) Norian GSSP candidate
M. Balini, A. Bertinelli, P. Di Stefano, P. Dumitrica, S. Furin, M. Gullo, C. Guaiumi, A. Hungerbuehler, M. Levera, M. Mazza, C. A. McRoberts, G. Muttoni, A. Nicora, N. Preto and M. Rigo

Conodont biostratigraphy and biofacies of the Henryhouse Formation (Ludlow-Pridoli, Silurian), southern Oklahoma, U.S.A.
James E. Barrick, F. Nicole Peavey and Mark A. Kleffner

Evolutionary patterns in conodont faunas of the Simpson Group, south-central Oklahoma
Jeffrey A. Bauer

The Ordovician conodont *Amorphognathus ordovicicus* Branson and Mehl and the evolution of *Amorphognathus* Branson and Mehl, a key genus in Ordovician conodont biostratigraphy
S.M. Bergström and S. A. Leslie

The Middle Silurian (Wenlock) Eramosa Lagerstätte of the Bruce Peninsula, Ontario, Canada
Peter H. von Bitter and Mark A. Purnell

Possible Conodont Eggs from the Pennsylvanian (Middle Desmoinesian) of NW Illinois, U.S.A.
Peter H. von Bitter and Joseph A. Pohl

Viséan to Serpukhovian (Carboniferous) occurrences of *Lochriea* species at the Vegas de Sotres section (Cantabrian Mountains, Spain)
S. Blanco-Ferrera, J. Sanz-López and L.C. Sánchez de Posada

Alteration and overgrowth on the conodont surface: a study case from NE Cantabrian Zone (Spain)
S. Blanco-Ferrera, J. Sanz-López, S. García-López and F. Bastida

Possible function of the elements in the *Polygnathus linguiformis linguiformis* apparatus
P. Bultynck

Imprint of euconodont animal from the Lower Carboniferous shale of the Northern Urals
Galina I. Buryi and Alla P. Kasatkina

Original data on ultramicroscopic structure of euconodont animal imprint from the Northern Urals
Galina I. Buryi, A.P. Kasatkina and P.P. Safronov

Morphotypes in the early *Siphonodella* lineage: implications for the definition of the Devonian/Carboniferous boundary
Carlo Corradini and Sandra I. Kaiser

Conodonts from the Silurian and lowermost Devonian from the Rifugio Lambertenghi Fontana III Section (Wolayer area, Carnic Alps, Italy)
Maria G. Corriga and Carlo Corradini

Permian cool water environments within the tropics/subtropics: Carboniferous and Permian of Western Pangea shelves
Vladimir Davydov

Lower Famennian conodonts from the Burtebayian Formation in the western Kazakhstan
Yu.A. Gatovsky

Conodont evolution trend around Norian/Rhaetian boundary in the Lagonegro succession, Southern Apennines, Italy
Nicola Giordano, Manuel Rigo and Gloria Ciarapica

Morphometry and specific differentiation from the example of Devonian *Palmatolepis* conodonts
Hélène Goubel, Carine Randon and Catherine Crônier

Early Triassic conodont clusters from South China: Revision of the architecture of the 15-element apparatuses of the Gondolelloidea superfamily
N. Goudemand, M. Orchard, P. Tafforeau, S. Urdy, T. Bruhwiler, H. Bucher, A. Brayard and T. Galfetti

An animated functional model of the Lower Triassic *Novispathodus* apparatus based on X-ray synchrotron microtomography and computer graphics
N. Goudemand, M. Orchard and P. Tafforeau

Conodont deformation in the Devonian tentaculite limestone of the Villasalto area (SE Sardinia, Italy)
Sofie Gouwy

Gondolellid Cyclic Tooth Morphology: Conodont Paleobiologic Food for Thought
Charles M. Henderson

Evolution and Geochronology of the *Sweetognathus* lineage from Bolivia and the Urals of Russia; Biostratigraphic problems and implications for Global Stratotype Section and Point (GSSP) definition
Charles M. Henderson, Mark Schmitz, James Crowley and Vladimir Davydov

About The Apparatus of Triassic Gondolellacea
Francis Hirsch, Ali Murat Kilic and Pablo Plasencia

Thermal Maturity within the Western Canada Sedimentary Basin, west-central Alberta to northeastern British Columbia and its Tectonic Implications for Pennsylvanian and Permian Strata
Jenifer Ing and Charles Henderson

Phylogeny of *Hindeodus-Isarcicella* across the Permian-Triassic Boundary
Haishui Jiang, Richard J. Aldridge and Xulong Lai

Late Devonian to Early Mississippian conodont biostratigraphy of the uppermost Wabamun Group and Palliser Formation through to lower Banff Formation, Southern Alberta and Southeastern British Columbia, Canada
D.I. Johnston, C.M. Henderson and M.J. Schmidt

Testing hypotheses of conodont ecology using element wear and damage
David Jones, Mark A. Purnell and Peter H. von Bitter

Directional evolutionary character change in the conodont *Pterospathodus*
David Jones

Reworked conodonts of the Alexander Terrane: Utility and lithologic occurrence
Erik C. Katvala, Charles M. Henderson and Tyler W. Beatty

Revised Conodont-, Graptolite-, Chitinozoa-, and Event-Based Telychian-Lochkovian (Silurian-Early Devonian) Chronostratigraphy Developed Using Graphic Correlation
Mark A. Kleffner and James E. Barrick

Revised conodont zonation across the P/T boundary at Shangsi section, Sichuan, China
Xulong Lai and Haishui Jiang

Conodont and Graptolite Co-Occurrence in Ordovician Dark Shale Sequences
S.A. Leslie, D. Goldman, N.A. Williams, L.M. DeRose and A.D. Hawkins

Early *Ancyrodella* from Basibé, a second extinction!
J.-C. Liao and J.I. Valenzuela-Ríos

Permian Conodonts (Artinskian- Early Djulfian) from Ruteh and Nesen formations in Central Alborz, North Iran
Masoumeh Mahavi and Seyed Hamid Vaziri

Shallow-water conodonts of the Uppermost *marginifera*–Middle *expansa* zones in Poland
Hanna Matyja

Evolutionary patterns and phylogeny of the Carnian/Norian conodonts from the Pizzo Mondello section, GSSP candidate for the base of the Norian
Michele Mazza, Manuel Rigo and Andrea Cau

Middle Pennsylvanian conodonts (Carboniferous) from the Nevandi River Valley (Picos de Europa Unit, Cantabrian Zone, North Spain)
Carlos A. Méndez

Middle Pennsylvanian conodont biostratigraphy employing the genus *Neognathodus*
Glen K. Merrill

Base of the *Cordylodus proavus* Zone (FAD of *Cordylodus andresi*) as a key horizon for Late Cambrian global chronocorrelation
James F. Miller and John E. Repetski

Upper Eifelian polygnathid-icriodid assemblages from Belarus and their biostratigraphic and paleogeographic significance
Katarzyna Narkiewicz and Semen Kruchek

Mid-Carboniferous boundary conodonts of the Cantabrian Mountains (Palencia, Spain)
Tamara I. Nemyrovska

Distribution of *Hindeodus wordensis* Wardlaw, 2000 in space and time
Alda Nicora, Aymon Baud, Charles M. Henderson, Lucia Angiolini and Benoit Beauchamp

A brief history of Triassic conodonts and their role in time scale definition
Michael J. Orchard

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
D. Jeffrey Over, Matthew Travis, Patrick Morgan, Gordon Baird, Stephen Rosscoe, Alex Bartholomew and

Thomas Schramm

Conodonts and correlation of the Woodford Shale, Upper Devonian-Lower Carboniferous, in the subsurface of western New Mexico and western Texas
D. Jeffrey Over and Stephen Ruppel

Ontogenic Development of the Middle Triassic *Pseudofurnishius murcianus* (Van den Boogaard) and Reorientation of its P1 element
P. Plasencia, F. Hirsch and A. Márquez-Aliaga

Conodont tooth complexity: quantification, convergence with mammals, and implications for dietary analysis
Mark A. Purnell and Alistair R. Evans

Conodont biostratigraphy of the Naqing (Nashui) section in South China: candidate GSSPs for both the Serpukhovian and Moscovian Stages
Yuping Qi, Xiandong Wang, Zhihao Wang, H. Richard Lane, Barry C. Richards, Ueno Katsumi and John R. Groves

Conodont faunas from the Durness Group, NW Scotland: determining the sequence stratigraphic history of a fragment of the Laurentian passive margin
R.J. Raine and M.P. Smith

First finds of Changhsingian conodonts (late Permian) in radiolarites from northern Thailand: paleogeographic and paleoecologic implications
Carine Randon, Nutthawut Wonganan and Martial Caridroit

The nektonic life of *Epigondolella praeslovakensis and Mockina slovakensis* conodont-animals: surface water dwellers of peritidal to basinal environments
Manuel Rigo, Guido Roghi, Anna Breda, Matteo Belvedere, Piero Gianolla, Stefano Furin and Paolo Mietto

Generic turnovers of Carnian/Norian conodonts: climatic control or competition?
Manuel Rigo, Michele Mazza, Stefano Furin and Christoph Spötl

Morphological features, possible functions, and evolution of Late Carboniferous idiognathodid P1 elements
Steven J. Rosscoe and James E. Barrick

Probable presence of old species of *Declinognathodus* in the Mississippian and the correlation with the Mid-Carboniferous boundary in the Cantabrian Mountains (Spain)
J. Sanz-López and S. Blanco-Ferrera

Changes in the species of *Gnathodus* from the upper Tournaisian of the Cantabrian Mountains and Pyrenees (Spain and France)
J. Sanz-López, S. Blanco-Ferrera and M.F. Perret-Mirouse

Changes of the apatite overgrowth on the surface of diacaizonal conodonts from the Cantabrian Zone (Spain)
J. Sanz-López, S. Blanco-Ferrera and S. García-López

Late Devonian conodonts and associated isotope geochemistry from northwestern Thailand
N.M. Savage, G. Racki, P. Lutat and A. Sardsud

Marine Ecotonal Transition and New Age Constraints of Ammonoids within the Dry Mountain Trough, Nevada
Tamra A. Schiappa and Claude Spinosa

Permo-Carboniferous Conodonts and Tuffs: High-Precision Marine Sr Isotope Geochronology
Mark D. Schmitz, Vladimir I. Davydov and Walter S. Snyder

Lopingian (Later Permian) high-resolution conodont biostratigraphic framework in South China and Iran
Shuzhong Shen and Shilong Mei

Apparatus reconstruction of *Lanea carlsi* (Spathognathodontidae, Conodonta) and mid-Lochkovian conodont stratigraphy
Ladislav Slavík

The nature and cause of the Great Ordovician Biodiversification Event (GOBE): new ideas and data from conodont paleothermometry
Julie A. Trotter, Ian S. Williams, Christopher R. Barnes, Christophe Lécuyer and Robert S. Nicoll

Devonian Conodonts from the Tor-Casamanya Synclinorium (Andorra); a preliminary report
J.I. Valenzuela-Ríos, J.-C. Liao, P. Clariana and I. Gil

Thermal Maturation and Burial History of the Lower Paleozoic in the Argentine Precordillera from Conodont Colour Alteration Data
G. G. Voldman and G. L. Albanesi

A mathematical approach to the assessment of the conodont colour alteration index (CAI)
G. G. Voldman, R. A. Bustos Marún and G. L. Albanesi

The Conodont Biostratigraphy of Middle Asselian to Early Sakmarian strata of the Fosheim–Hamilton subbasin, Sverdrup Basin, Canadian Arctic: The retreat and extinction of genus *Streptognathodus* in response to interpreted thermocline shallowing and oceanic cooling
Michael L. Wamsteeker, Charles M. Henderson and Benoit Beauchamp

On the age of *Gallowayinella* (fusulinids) based on conodonts
Ping Wang and Cheng-yuan Wang

Evolution of the Late Guadalupian Permian basin of West Texas and its *Jinogondolella* species
Bruce R. Wardlaw and Merlynd K. Nestell

Biostratigraphy of the Santa Rosita Formation (Furongian-Lower Ordovician), Cordillera Oriental of Jujuy, Argentina
F. J. Zeballo, G. L. Albanesi and G. Ortega

Refinement of Changhsingian conodonts and zonation from the Xiakou section, western Hubei Province, South China
Ning Zhang, Wenchen Xia and Charles M. Henderson

Permian cyclic sedimentation of the Johnston Canyon Formation, southwestern Alberta and southeastern British Columbia, Canada
Kate Zubin-Stathopoulos and Charles M. Henderson

September 14-18, 2009, Paleozoic Seas Symposium, Institute of Earth Sciences, Karl-Franzens-University, Graz, Austria

The Paleozoic Seas Symposium held in Graz last autumn was attended by 30 participants coming from 11 different countries who performed oral or poster presentations on their recent studies related to stratigraphy, paleontology, paleoecology, geochemistry, and other topics. Additionally to the scientific program, single day excursions to Devonian sections of the Graz Paleozoic and the Carboniferous sequence of the Carnic Alps took place during the second half of the meeting. As far as concerns conodont related presentations, contributions dealt with the Standard Zonation concept of Silurian conodont zones, the conodont

distribution across the Silurian/Devonian boundary of the Carnic Alps and Early to Middle Ordovician conodonts from NE Spiztbergen. The Abstract volume can be downloaded via:
http://www.uni-graz.at/thomas.suttner/PDFeditorials/PSS_Abstract%20Volume.pdf
Due to the success of this meeting a second one is scheduled for 2011; meeting venue: Beroun (Czech Republic). For further information please contact Stepan Rak (deiphon@geologist.com). We hope to see some more *Panderer* joining the upcomming symposium. Topics will concern ocean modelling, paleoclimate, paleobiogeography, global biotic crisis, geochemistry and stratigraphy of the Iapetus, Panthalassic Ocean, Paleo-Tethys, Rheic Ocean, Tethys or the Tornquist Sea.

(submitted by Thomas Suttner)

The following five abstracts involving conodonts were presented at the Paleozoic Seas Symposium

Late Devonian (latest Frasnian–Famennian) faunas from the 'Hongguleleng Formation' and the F–F boundary in northern Xinjiang, NW China

CHEN, X.-Q.[1], MAWSON, R.[2], SUTTNER, T.J.[3], TALENT, J.A.[2], FRÝDA, J.[4], MATHIESON, D.[2], MOLLOY, P.[2] & BERKYOVÁ, S.[4,5]

(1) Chinese Academy of Sciences, Nanjing Institute of Geology and Palaeontology, Department of Invertebrate Palaeontology, 39 East Beijing Road, Nanjing 210008, China; *xqchen@nigpas.ac.cn*
(2) Earth and Planetary Sciences,Macquarie University 2109, Australia; *rmawson37@gmail.com*; *jatalent@yahoo.com*
(3) Austrian Academy of Sciences (CPSA) c/o University of Graz, Institute of Earth Sciences (Geology and Palaeontology), Heinrichstrasse 26, A-8010 Graz, Austria; *thomas.suttner@uni-graz.at*
(4) Czech Geological Survey, Geologicka 6, 15000 Prague, Czech Republic; *stanislava.berkyova@geology.cz*; *fryda@cgu.cz*
(5) Charles University, Dept. of Geology and Palaeontology, Albertov 6, 12843 Prague 2, Czech Republic

We present a progress report, based on close-sampling of eight stratigraphic sections and numerous spot samples through the richly fossiliferous Late Devonian–Early Carboniferous 'Hongguleleng Group' – especially at Genaren, Yidimaodongeo and the type locality for what was originally referred to as the 'Hongguleleng Formation', on the west limb of the Boulonguer Syncline, north of Boulonguer Reservoir – c. 27 km NE of Hoxtolgay, NW Xinjiang, China.
The area has proved noteworthy for its astonishing faunal diversity; this has resulted in much discussion about stratigraphic alignments with other areas in China and elsewhere globally (e.g., XU *et al*. 1990, ZHAO & WANG 1990, XIA 1996 and 1997a), and whether or not the 'Hongguleleng' sequence had been part of a region that had escaped most of the impact of the Kellwasser events (e.g., WATERS *et al*. 1991 and 1995, MAPLES *et al*. 1996, LANE *et al*. 1996 and 1997, LIAO 2002, CHEN 2002, CHEN & LIAO 2006), in other words, had been a biological refugium and, because of this, had retained through much of Famennian time, a higher level of biological diversity than encountered in most other areas of the globe. Because of the taxonomic diversity, especially of the lower 95 m or so of the sequence, there have been numerous publications, exemplified by those on acritarchs (LU & WICANDER 1988), corals (LIAO & CAI 1987, CAI 1996, SOTO & LIN 2000), brachiopods (CHEN *et al*. 2002, CHEN & LIAO 2006 and CHEN ms. and under investigation), bryozoans, conodonts and microvertebrates (XIA 1997b), and above all, crinoids and blastoids (HOU *et al*. 1994, LANE *et al*. 1995 and 1997, WATERS *et al*. 2003). Because ages assigned to the 'Hongguleleng Group' have differed widely, we have attempted to obtain more precise data on lithologies, conodont biostratigraphy, biofacies and colour-alteration indices (CAI), as well as stable isotopes, faunal diversity (all taxonomic groups) and the succession of faunas through this richly fossiliferous sequence.
As far as ages are concerned, our prime focus has been on conodonts. Because the conodont faunules obtained by acid-leaching are shallow-water associations, consisting overwhelmingly of long-ranging forms we undertook bed-by-bed sampling. In the case of the stratotype sequence on the west limb of the Boulongour Syncline, we took 194 samples for conodonts and isotopic data. These have demonstrated:
1. The base of the 'Hongguleleng Group' rests on the volcanic and volcano-clastic Zhulumute Formation. A brief interval of *linguiformis* Zone occurs at the base of the 'Hongguleleng Group'.
2. At 2.7 m, the upper limit of the *linguiformis* Zone is marked by the incoming of *Palmatolepis triangularis* (ZIEGLER & SANDBERG 1990). In the *triangularis* Zone (from 2.7 to 22.7 m), the proportion of palmatolepids to other conodonts decreases, concurrent with an overall increase in diversity of conodont species.
3. The incoming of *Palmatolepis crepida* at 22.7 m is taken as indicative of that zone.4. Because *Polygnathus subnormalis* VORONTOSOVA & KUZ'MIN is regarded as extending from mid- *rhomboidea* to early *trachytera* zones, conodonts from 53.8 m with this species must be at least that age. *Note*: no

conodonts were found in the 10-metre interval from 33.8 to 53.8 m.
5. Typical *marginifera* Zone conodonts occur in the interval 73.3 to 92.9 m.
6. At 94.2 m, the flaggy limestone-shale sequence gives way abruptly to a sequence of green and pink indurated siltstones.
7. At 113.9 m, a brief interval of flaggy limestone (c. 0.25 m) has produced a conodont faunule referrable to the *trachytera* Zone.
Because the stratigraphy of the 'Hongguleleng Group' is complex, involving new members and formations still requiring lithologic and faunal documentation as well as designation of stratotypes, we do not anticipate what their names will be nor the location of their type localities. Some workers have proposed that the 'Hongguleleng Formation/Group' extends into the Early Carboniferous (LAIO 1987, XU *et al*. 1990). Marine conditions appear tohave indeed extended into the Early Carboniferous, but are not yet well documented in the area we have studied, though are documented from elsewhere (e.g., RUAN 1995). The previously proposed Hebukeke Formation, thought to be Early Carboniferous, is, however, a tectonically smashed sequence of the lowest 20-30 m. of the 'Hongguleleng Formation/Group', and a limestone lens on the east limb of the Boulonguer Syncline, thought to be Early Carboniferous (XIA 1997b), is lithologically and faunistically a basal sequence of the 'Hongguleleng Formation/Group'.

The Standard Zonation concept – examples from the Silurian conodont zonation

CORRADINI, C.[1] & BARRICK, J.E.[2]
(1) Dipartimento di Scienze della Terra, Università di Cagliari, via Trentino 51, I-09127 Cagliari (Italy); *corradin@unica.it*
(2) Department of Geosciences, Texas Tech University, Lubbock, TX 79409-1053, USA; *jim,barrick@ttu.edu*

The primary goal of biostratigraphy is to correlate distant bodies of rocks on the basis of their fossil content. Zonation schemes have been prepared for this purpose by numerous authors based on different fossil groups for the various Periods of geological time. Such zonation schemes are commonly named "Standard Zonations", but not all of them possess the characteristics that a standard zonation should have:
a. The zones should be widely recognized and applicable across as broad as geographic region as possible.
b. Zones should be based on described and named taxa only.
c. Index taxa should be easy to recognize unequivocally and have a broad geographic distribution
d. The basic biostratigraphic unit is the "zone". Superzones and subzones are not used.
e. The definition of the zones should be clearly stated in scientific journals of wide accessibility.
Zonation schemes can be developed for limited geographic areas only. These regional zonations can be based on endemic taxa and may allow more detailed correlation within the region than the standard zonation. When regional zonations are presented, though, these should be compared to the standard scheme. The history of the Silurian conodont zonations offers some examples to illustrate these points and to show the difficulties that may arise when developing a Standard Zonation.
The first conodont zonation for the Silurian was proposed by WALLISER (1964), who based his scheme primarily on the Cellon Section (Carnic Alps, Austria), taking in account also data from Bohemia and Spain. The author defined twelve successive appearance zones spanning the Silurian and the lowermost Devonian. Several of these zones have been widely recognized, but the difficulties of applying the complete scheme in other parts of the world have led to the development of many local zonations, mainly for the Llandovery, which is not completely exposed in Cellon. ALDRIDGE & SCHÖNLAUB (1989), considering all the data available at that time, provided a new scheme, which was a "step on the path to the development of a reference biozonation" (p. 275). Their global zonation was reported also in the Newsletter of the Subcommission of Silurian Stratigraphy (Silurian Times n°1; 1993). Two years later, a new Conodont Global Zonation chart appeared (Silurian Times n°3; NOWLAN 1995) that was significantly different from previous zonations, but this new zonation was never fully justified or discussed.
CORRADINI & SERPAGLI (1998, 1999) proposed a new scheme, based on Sardinian data. The authors demonstrated that the Sardinian conodont zonation is usable worldwide and claimed that it is "of practical use for Silurian biostratigraphy, and therefore more generally useful than extremely detailed schemes, sometimes based on not yet defined or endemic taxa" (CORRADINI & SERPAGLI 1999: p. 270). Following these considerations, the same authors (CORRADINI & SERPAGLI 2000) proposed their scheme as a Standard Silurian Conodont Zonation for the Wenlock-Pridoli time span. A totally different approach to the Standard conodont zonation was presented by JEPPSSON (1997, 2006), who provided a detailed scheme of zones based on the Silurian succession exposed on Gotland. Unfortunately, many zones are not applicable in other regions, either because they reflect the local environmental conditions on Gotland, or because some zonal markers are extremely rare taxa (<0.1% of the fauna) or endemic taxa. Finally, OGG *et al*. (2008) published a zonation intermediate between those introduced by NOWLAN (1995) and CORRADINI & SERPAGLI (1999), but some problems still remain, mainly the occurrence of a "not zoned" interval in the lower Ludlow.

Other unresolved problems arose recently from the taxonomic revision of some ozarkodinids started by a few authors in the last five years (MURPHY *et al*. 2004, CARLS *et al*. 2005 and 2007), who left without a taxonomic home several morphotypes previously identified as *Oz. remscheidensis*. We agree that these taxa may represent several different species within the Genus *Zieglerodina*, but it is necessary to complete soon the revision of these forms at a species level (and not at genus level), in order to avoid the taxonomic and nomenclatural chaos that we observe now. The proposal by CORRIGA & CORRADINI (2009) and CORRIGA *et al*. (2009) to rename the former "*remscheidensis* interval Zone" as "*eosteinhornensis* s.l. interval Zone" without changing the meaning of the zone and the definition of its boundaries is a temporary solution and can be accepted only until that taxonomic work is concluded.

The Silurian-Devonian Boundary in the Rifugio Lambertenghi Fontana III Section (Wolayer area, Carnic Alps, Italy)

CORRIGA, M.G.[1], CORRADINI, C.[1], LEHNERT, O.[2], JOACHIMSKI, M.M.[2], PONDRELLI, M.[3] & SIMONETTO, L.[4]
(1) Dipartimento di Scienze della Terra, Università di Cagliari, via Trentino 51, I-09127 Cagliari (Italy); *maria.corriga@unica.it*; *corradin@unica.it*
(2) University of Erlangen-Nürnberg, Geozentrum Nordbayern, Abteilung Krustendynamik, Schloßgarten 5, D- 91054 Erlangen, Germany; *lehnert@geol.uni-erlangen.de*; *joachimski@geol.uni-erlangen.de*
(3) International Research School of Planetary Sciences, Dipartimento di Scienze, Università d'Annunzio, viale Pindaro 42, I-65127 Pescara (Italy); *monica@irsps.unich.it*
(4) Museo Friulano di Storia Naturale, via Marangoni 39-41, I-33100 Udine (Italy); *mfsn@comune.udine.it*

In the Carnic Alps one of the most complete Palaeozoic sedimentary successions is exposed at the Italian-Austrian border. Deposition was almost continuous from Upper Ordovician to Permian. Silurian and Lower Devonian sediments are irregularly distributed within the Carnic Chain, from the Monte Cocco area at the East, to Lake Wolayer at the West. In general, the outcrops are quite small, mainly on the Italian side, with the only exception of Mt. Cocco and La Valute areas.
The Rifugio Lambertenghi Fontana III (RLF III) Section is located just south of Lake Volayer. The area is well known for the abundant outcrops of Upper Ordovician to Devonian sediments which formed mainly in shallow water environments.
The RLF III Section exposes about 15 m of grey-reddish "*Orthoceras* limestones". The section is subdivided into two parts, separate by a covered interval of about 10 m. The lower part (samples RLF III 4-3A) consists of about 4 m of brown-reddish micritic limestone, with a few fossils remains (mainly brachiopods and crinoids); it can be referred to lower Pridoli thanks of the occurrences of *Oz. snajdri* and *Oz. eosteinhornensis* s.s.. However, this abstract focuses on the upper part of the section, which includes the Silurian/Devonian boundary. Lithologies here show an irregular alternation of grainstones and wackestones-packstones. Crinoids are always very abundant, brachiopods are common. Rare nautiloid cephalopods and trilobites have been observed in some levels. A very shallow water environment can be suggested for the deposits in this upper part of the section.
Seventeen conodont samples were collected and processed with the conventional formic acid technique. All investigated levels were productive and about 1200 conodont elements were recovered. The state of preservation is generally quite good, even when a few elements are broken or slightly deformed. The conodont colour is dark brown, corresponding to a Colour Alteration Index of 3.5-4. In general the lower part of the section, up to level RLF III 2, is richer in conodonts (up to 110 elements/kg), whereas abundance strongly decreases in the upper part (1-13 elements/kg), in connection to the shallower depositional environment.
Twenty taxa, belonging to ten genera (*Belodella*, *Coryssognathus*, *Dapsilodus*, *Icriodus*, *Oulodus*, *Ozarkodina*, *Panderodus*, *Pseudooneotodus*, *Wurmiella* and *Zieglerodina*) were discriminated.
Wurmiella excavata and *Panderodus unicostatus* are very abundant in the lower part of the section.
Belodella, both *B. anomalis* and *B. resima* are constantly present.
It is difficult to precisely locate the Silurian/Devonian Boundary. Due to the scarcity of the fauna in the upper part of the section there is a wide biostratigraphic frame:
1. *Icriodus hesperius*, an index taxon of the basal Devonian, occurs only at very top of the section in sample RLF III 1;
2. *Ozarkodina confluens* (= *Oz. typica* sensu MURPHY *et al*. 2004) is limited to Silurian. It has its last occurrence in sample RLF III 1W.
However, we tentatively place the boundary between samples RLF III 1K and 1B (Fig. 1) based on the δ13C record in the section.
The carbon isotope data suggest to locate the S/D boundary in the upper part of the prominent δ13C shift, between samples RLF III 1K and 1B, and just before the δ13C values reach their maximum. This basal Devonian "plateau"-like peak in the carbon curve is known also from the Prague Basin (BUGGISCH &

MANN 2004: fig. 2). The characteristic 2‰ shift in δ13C starts in the latest Pridoli and the position of the S/D boundary within the rising limb of the carbon peak is documented from different peri-Gondwana locations (BUGGISCH & MANN 2004) and from Laurentia (SALTZMAN 2002).

The Tremadocian through Darriwilian conodont succession of NE Spitsbergen: faunal affinities and intercontinental correlation

LEHNERT, O.[1], STOUGE, S.[2] & BRANDL, P.[1]
(1) University of Erlangen-Nürnberg, Geozentrum Nordbayern, Abteilung Krustendynamik, Schloßgarten 5, D- 91054 Erlangen, Germany; *lehnert@geol.uni-erlangen.de*; *Philipp.Brandl@asamnet.de*
(2) Geological Museum, University of Copenhagen, Øster Voldgade 5-7, DK-1350, Copenhagen K, Denmark; *svends@snm.ku.dk*

The strata of the Cambro–Ordovician Oslobreen Group, composed of the Tokammane (Cambrian), Kirtonryggen (Lower Ordovician) and Valhallfonna (Middle Ordovician) Formations are exposed along the coast of Ny Friesland in NE Spitsbergen. The Lower to Middle Ordovician conodont faunas of this region are very well preserved displayed also by the CAI 1 of the material in the collections.A low yield is typical for the lower part of the Kirtonryggen Formation. The oldest Ordovician conodont faunas span the *Rossodus manitouensis* through *Macerodus dianae* zones (Tremadocian, Spora and Basisletta Member) followed by the Floian *Oepikodus communis* Zone recovered from the richer upper part of the formation (Nordporten Member). All the taxa are typical of the tropical North American Midcontinent faunal province (e.g., species of *Eucharodus*, *Ulrichodina*, *Aloxoconus, Colaptoconus, Macerodus, Oneotodus*) and can well be correlated to the North American Standard Zonation (Ross *et al*. 1997). The different facies display deposition under warm conditions and large stromatolithes are recognized within the sub- to intertidal dolostones of the Basisletta Member (FORTEY & BRUTON 1973). Carbonates of the overlaying Nordporten Member reflect more open marine conditions (mudto wackestones with grainstone interbeds, water depth between FWB and SWB; BRANDL 2009).
The tropical Midcontinent-type assemblages dominated the region until open marine associations invaded the shallow shelf (i.e. *Evae* transgression). The pandemic *Oepikodus evae* becomes frequent and is succeeded by *O. intermedius* in abundance in the Olenidsletta Member, i.e. the lower member of the Valhallfonna Formation. In this part of the succession, the most common associated species are *Bergstroemognathus, Protoprioniodus, Protopanderodus, Oistodus, Wandelia, Phragmodus,* and *Semiacontiodus*. These faunas of mixed affinities display more open marine conditions which is supported by oxygen isotope data. The δ18O values indicate that relatively cooler sea-water temperatures prevailed from the *O. evae* Zone and upwards. The Olenidsletta Member formed in deeper water environments and is dominated by dark platy, graptolite-bearing mudstones with thin marly intercalations (e.g., FORTEY & BRUTON 1973, FORTEY & COCKS 2003, BRANDL 2009). The upper strata (Profilbekken Member) are characterized by the *Periodon-Paroistodus* assemblage characteristic for outer shelf, shelf margin, and upper slope settings around Laurentia and may especially well be compared with the faunal succession of Newfoundland (e.g., STOUGE 1984, JOHNSTON & BARNES 1999).
The Valhallfonna Formation comprises the Floian and Dapingian stages and ends in the early Darriwilian *Lenodus variabilis* Zone. Palaeobiogeographically, the Ny Friesland faunas show close affinities to coeval assemblages from North-East Greenland and West Newfoundland. The occurrence of early Darriwilian *Phragmodus spicatus* and *Juanognathus leptosomatus* known from Australo-Asian peri-Gondwana allows us also to correlate precisely to these areas.
Our conodont zonation is closely tied to a recently established δ13C isotope curve from Ny Friesland (BRANDL 2009) and a correlation to δ13C curves from North East Greenland, Newfoundland (AZMY *et al.*, unpublished, pers comm. 2009) and Argentine Precordillera (BUGGISCH *et al*. 2004) is presented. Observed sea-level changes are compared with the detailed Ordovician sea-level curve established by NIELSEN (2004). Finally, the palaeogeographical implications of characteristic gaps in the sedimentary successions of thedifferent terranes along the northern Laurentian margin (e.g., HARLAND 1997, SMITH 2000, STOUGE *et al*. 2001, KNIGHT *et al*. 2001) are discussed.

Gravity and current induced resedimentation of a Devonian carbonate platform (Mt. Freikofel, Carnic Alps)

SCHNELLBÄCHER, P.
Ernst-Moritz-Arndt Universität Greifswald, 17489 Greifswald, Germany; *f-23a@gmx.de*

During the last 3 years two field campaigns took place which were undertaken to carry out more detailed information on the sedimentological and stratigraphical composition of Mt. Freikofel (Carnic Alps). These investigations resulted in a log that measures approximately 55 m (section Bachelor) and a second one with

275 m (section Master – see Fig. 1).
Additionally conodont samples were taken to define the age of the first profile. The sampled section ranges from the early *falsiovalis* Zone (*Mesotaxis asymmetrica)* to the early *hassi* Zone (*Palmatolepis hassi)* (STARK 2007). According to that, an interval of about 2.5 Ma (Givetian to middle Frasnian) isdocumented at Mt. Freikofel.
During our investigation of the facies and the depositional environment we used the classification and scheme of MULDER & ALEXANDER (2001) for marine gravity flows which is classically used for clasticresedimentation. Gravity flow deposits and sediments with a pelagic origin were diagnosed. The lithoclastic limestones which we observed within the section could be subdivided into resediments of hyperconcentrated density flows, concentrated density flows and turbidity currents according to distinctive sedimentary structures evident.
In Devonian times, the section was located at the proximal slope (according to WILSON 1975 *in* FLÜGEL 2004). Furthermore a reef fauna associated with pelagic fossils was identified. Sedimentary and microfacies analysis confirm this scheme. The sediment concentration within the ancient gravity flows is constantly reduced with gaining distance from the sections bottom. An equal development can be observed regarding the grain-size. In contrast to that, thickening upward of the beds is recognized towards the top of the section.
The composite of three measured sections shows several shifts in lateral extension. For example a gradual transition from grainstones to lithoclastic limestones with reef debris at the basal part of the section. Along the section the reef fauna (LISCHKA, SCHNELLBÄCHER 2007) was associated with pelagic fossils like cephalopods, foraminifers and tentaculites. Another transition shows a gradual change from lithoclastic limestones to mudstones in the upper part of the sections. Flow direction markers, pointing from Mt. Cellon to Pal Grande, were identified in two layers.

April 11-13, 2010, Current Conodont Research: a Pander Society Session in Honour of Raymond Ethington, Tom Thompson, and Jim Miller, featured in the **joint North-central/South-central Geological Society of America meeting, Branson, Missouri, U.S.A.**

One of the Theme Sessions on *Paleontology, Stratigraphy, and Sedimentology* cosponsored by the Pander Society and conducted by Darwin Boardman (Oklahoma State University), Damon Bassett (Missouri State University) and John Repetski (U.S. Geological Survey).

Abstracts were for the theme session.

CONODONTS AND BIOSTRATIGRAPHY OF THE GUNTER SANDSTONE MEMBER OF THE GASCONADE FORMATION IN SOUTHERN MISSOURI

REPETSKI, John E., U.S. Geol. Survey, 926A National Ctr, Reston, VA 20192, JREPETSKI@USGS.GOV, WEARY, David J., U.S. Geological Survey, MS926A National Center, Reston, VA 20192, and ETHINGTON, Raymond L., Geological Sciences Department, University of Missouri, 101 Geological Sciences Bldg, Columbia, MO 65211

The Gunter Sandstone forms the basal unit of the Gasconade Dolomite in southern Missouri. It comprises beds of quartzose, medium- to thick-bedded, commonly cross-bedded, and sometimes dolomite-cemented sandstone, and thin- to medium-bedded, sometimes quartz-silty to quartz-sandy dolomite. The Gunter ranges from 5 to 15 meters thick in the region and is a regionally significant aquifer. Because the underlying Eminence Dolomite and overlying middle and upper members of the Gasconade originally were thought to lack sandstone beds, the Gunter served as an easily recognizable marker bed for mapping. Our recent geologic mapping has demonstrated that the Eminence Dolomite does indeed locally contain some quartz sandstones in its upper part, some of which are physically indistinguishable from typical Gunter sandstones. Conodont studies from several measured sections from Camden to Carter Counties, including the type section of the Gunter, show that the upper Eminence ranges in age from the *Eoconodontus* or *Proconodontus* Zone to at least the *Clavohamulus elongatus* Subzone of the *Cordylodus proavus* Zone. These uppermost Cambrian strata are unconformably overlain by the Gunter sandstones *sensu stricto*. These basal Gunter sandstones yield only unidentifiable, well-rounded fragments of conodonts. Dolomitic beds immediately higher contain scant, non-diagnostic faunas; the lowermost of these which can be assigned a confident age range from the uppermost Cambrian *Cordylodus intermedius* Zone to the lowermost Ordovician *Cordylodus angulatus* Zone. A chertified zone (silcrete?) capping the Eminence at some sections would appear to indicate an extended period of non-deposition following the time of the *C. elongatus* Subzone at which these Eminence beds are dated. We tentatively conclude that the overlying basal Gunter sandstone represents a transgressive event that is widely-recognized over much of Laurentia –

the Stonehenge Transgression event of authors.

CONODONT ASSEMBLAGES FROM THE MIDDLE ORDOVICIAN WINNESHIEK LAGERSTATTE, NORTHEAST IOWA

LIU, Huaibao P., WITZKE, Brian J., and McKAY, Robert M., Iowa Geological & Water Survey, Iowa Department of Natural Resources, 109 Trowbridge Hall, Iowa City, IA 52242, paul.liu@dnr.iowa.gov

The Middle Ordovician (Whiterockian) Winneshiek Lagerstätte is preserved in a new stratigraphic unit included within the St. Peter Sandstone of northeast Iowa. It consists of greenish-brown to dark-gray sandy laminated shale with abundant organic carbon and pyrite. Fossils are extraordinarily preserved, including soft-body remains of several taxa. Recent research indicates that the shale was deposited within a local impact-related circular basin.

Conodonts, many occurring as natural assemblages, are an important constituent of the fauna that contains a variety of invertebrate and vertebrate taxa. To date, identified conodont assemblages include chirognathids (*Erismodus*, *Erraticodon*, *Chirognathus*), coleodontids (*Coleodus*, *Steroconus*), multioistodontids (*Multioistodus*), protopanderodontids (?*Oneotodus*, ?*Glyptoconus*), oistodontids ("*Acodus*"), and possibly others. The largest assemblages (1.3 cm long) are bimembrate containing six elements previously assigned to *Coleodus* and *Archeognathus*. Conodonts within the Winneshiek fauna commonly preserve complete basal plates, and some assemblages are associated with dark-brown to black organic materials. Denticles are usually amber in color, but color alteration is observed including white-colored mineral replacement.

Several conodont assemblages occurring within vermiform organic films are of special note. Two or three of these display similar fin-like structures, and one is associated with a 3-D segmented vermiform body, but further study is needed to confirm the nature and significance of these occurrences. The presence of conodont assemblages and soft-bodied fossils in the Winneshiek Lagerstätte provides high potential, with further collecting, for discovery of the oldest known conodont animal fossils.

MIDDLE ORDOVICIAN CONODONTS FROM THE ARKOMA BASIN, EASTERN OKLAHOMA

BAUER, Jeffrey A., ENGLE, Kevin J., and HOGGE, Audrey A., Department of Natural Sciences, Shawnee State University, 940 Second Street, Portsmouth, OH 45662, jbauer@shawnee.edu

The Arkoma Basin in eastern Oklahoma contains a subsurface record of Middle Ordovician marine sedimentation representing the upper Sauk Sequence. As the Sauk Sea receded from Laurentia, isolated to semi-isolated basins developed. Those basins were fertile sites for conodont evolution and yield both early and late representatives of important Midcontinent conodont lineages.

Well samples from Middle Ordovician intervals at five sites in the Arkoma Basin were processed for conodonts. Samples from several wells produced collections of "*Plectodina*" *joachimensis*, *Phragmodus flexuosus, Erismodus* sp., *Leptochirognathus* sp., among others, and are similar to those derived from outcrops of the McLish Formation (Simpson Group) of southern Oklahoma (Arbuckle Mountains) and the middle Tyner Formation of northeastern Oklahoma. Samples from one well contained *Neomultioistodus compressus, Drepanoistodus angulensis* "*Scandodus*" *sinuous, Oistodus multicorrugatus*, *Paraprioniodus costatus*, and *Histiodella sinuosa*. This fauna is similar to that found in exposures of the Oil Creek Formation (Simpson Group) in southern Oklahoma and Burgen and lower Tyner Formations in northeastern Oklahoma.The Arkoma Basin conodont faunas reflect a striking turnover that coincides with the final phase of Sauk regression. During this phase, Midcontinent faunas dominated by species of *Neomultioistodus*, "*Scandodus*", *Histiodella*, and *Oistodus* coexist with and then are replaced by members of *Phragmodus*, "*Plectodina*", and *Erismodus*.

A COMBINED CONODONT AND CARBON ISOTOPE CHRONOSTRATIGRAPHY FOR THE IBEXIAN SERIES OF WESTERN NORTH AMERICA

RIPPERDAN, Robert L., Earth and Atmospheric Sciences, Saint Louis University, 3642 Lindell Boulevard, Saint Louis, MO 63108, ripperdan@eas.slu.edu

A profile of stratigraphic variation in marine carbonate carbon isotopic ratios ($\delta^{13}C$) has been constructed

through the entire Ibexian Series in the type region of western Utah. The profile is comprised of over 700 individual samples from the Notch Peak Formation, the House Limestone, the Fillmore Formation, and the Wah Wah Formation, using the classic Hintze localities and sections developed by James Miller and collaborators. Existing conodont stratigraphies by Miller, Ethington, and others were used to calibrate a combined chronostratigraphic correlation framework for the Ibexian.

Several features in the $\delta^{13}C$ profile from the Lower Ibexian have been previously recognized, most notably as a sharp positive excursion near the base of the Stairsian Stage and an abrupt negative excursion (the Jose Event) near the base of the Tulean. Two new features, from the youngest Ibexian stage, are reported here. The new features are found as negative $\delta^{13}C$ excursions against a gently rising long-term trend, near the base and top of the Blackhillsian Stage.

The western Utah $\delta^{13}C$ profile has proven to be reliable in correlating conodont zone boundaries in other localities with well-known conodont faunas, most notably the El Paso Group. Current research into Lower Ordovician successions in the North American midcontinent suggest that the Ibexian $\delta^{13}C$ profile may be useful in providing age constraints for notably difficult units with sparse conodont faunas, such as the Cotter Dolomite in southwestern Missouri

A COMPOSITE TAXON RANGE CHART AND CONODONT BIODIVERSITY DYNAMICS FROM THE ORDOVICIAN OF BALTOSCANDIA

GOLDMAN, Daniel[1], PANTLE, Carolyn[1], SHEETS, H. David[2], and BERGSTROM, Stig M.[3], (1) Department of Geology, University of Dayton, 300 College Park, Dayton, OH 45469, dan.goldman@notes.udayton.edu, (2) Dept of Physics, Canisius College, Buffalo, NY 14208, (3) Ohio State Univ - Columbus, 155 S Oval Mall, Columbus, OH 43210-1308

Both CONOP 9 and a new method called Horizon Annealing were used to construct composite range charts from the stratigraphic range data of 159 conodont species in 24 boreholes and outcrops in Baltoscandia. We converted the composite sections to timescales in which to calculate biodiversity, extinction, and origination rates through the Early, Middle and Late Ordovician. The two methods produced broadly similar range charts and diversity curves that differed in small but interesting ways. We divided the composites into 1.15 my intervals (a temporal resolution twice that of the median zone duration) spanning the *Paltodus deltifer* through *Amorphognathus ordovicicus* conodont zones Our data show that overall biodiversity increases steadily from the base of the *P. deltifer* Zone to the base of the *E. suecicus* Zone, and then steeply declines throughout most of the remaining Ordovician. Interestingly, the start of this decline is coincident with the mid-Darriwilian (Kunda) regression and δ13C isotope excursion. Extinction rates climb steadily through the Early Ordovician, fluctuate around higher values during much of the Middle Ordovician, before reaching a peak low in the *E. suecicus* Zone. Extinction rates then drop again to pre-*E. suecicus* Zone values for the remainder of the Ordovician. Origination rates are very low across the Billingen-Volkhov boundary (base of the Dapingian) and climb to a peak in the late *Lenodus variabilis* Zone. Origination rates crash in the *E. suecicus* Zone and remain low until the late *A. tvaerensis* Zone when they begin to slowly rise again. Thus, the dramatic late Middle and Late Ordovician drop in conodont diversity in Baltoscandia appears to be attributable to depressed origination.

EVIDENCE FOR COOLING ACROSS THE DUBUQUE/MAQUOKETA CONTACT (UPPER ORDOVICIAN) USING CONODONT PALEOTHERMOMETRY

PUTMAN, Kelsey E., Geological Sciences, University of Missouri, 101 Geology Building, Columbia, MO 65211-1380, kepd32@mail.missouri.edu, MACLEOD, Kenneth G., Department of Geological Sciences, University of Missouri-Columbia, 101 Geological Sciences Bldg, Columbia, MO 65211, and ETHINGTON, Raymond L., Geological Sciences Department, University of Missouri, 101 Geological Sciences Bldg, Columbia, MO 65211

Oxygen isotope ($d^{18}O_{phos}$) conodont paleothermometry was used to estimate changes in water temperatures across the transition between the Dubuque and Maquoketa Formations at the western margin of the Upper Ordovician epeiric seaway in North America. Seven locations were sampled in a north-south transect in what is now eastern Iowa and Minnesota with three of the seven locations spanning the lithologic transition between the limestone-rich Dubuque Formation, and the shalely Maquoketa Formation. We have been targeting the conodonts *Drepanoistodus suberectus* and *Panderodus gracilis* for analysis due to their relatively high abundance in both formations. By utilizing species specific separates we gain a higher level of potential resolution as mixed separates may average conditions across the niches each species preferred.

Preliminary results indicate cooling across the lithologic boundary with values of $d^{18}O_{phos}$ ~18‰ V-SMOW in the Dubuque Formation and $d^{18}O_{phos}$ ~20‰ V-SMOW in the basal portion of the Maquoketa Formation. Sampling density is still low, but these preliminary results are consistent with a quasi-estuarine circulation model for the seaway with transgression of deep open ocean waters through time. In the model, fresh-water runoff from the Taconic highlands and surface winds drove a quasi-estuarine gyre that resulted in surface currents flowing basinward and out of the epeiric sea; while cool ocean water flowed into the epeiric sea through the Sebree Trough. The cooling trend seen at the Dubuque-Maquoketa boundary could be a reflection of the cool ocean waters coming in through the Sebree Trough. With additional data spanning a longer interval and additional sections, we hope to test whether this cooling event seen at the Dubuque-Maquoketa boundary is a single event, or one of many temperature fluctuations in the Upper Ordovician.

TELYCHIAN-EARLY SHEINWOODIAN (EARLY SILURIAN) CONODONT-, GRAPTOLITE-, CHITINOZOA-, AND EVENT-BASED CHRONOSTRATIGRAPHY DEVELOPED USING THE GRAPHIC CORRELATION METHOD

KLEFFNER. Mark A., School of Earth Sciences, The Ohio State University Lima, 4240 Campus Drive, Lima, OH 45804, kleffner.1@osu.edu and BARRICK, James E., Dept. of Geosciences, Texas Tech University, Lubbock, TX 79409-1053

Graphic correlation of several previously uncompiled stratigraphic sections with the Silurian Composite Standard of Kleffner and Barrick (2007) results in recognition, and “filling in,” of a Telychian unconformity in the Standard Reference Section (Cellon, Austria), and a revised Telychian-early Sheinwoodian (Early Silurian) Composite Standard (CS) that has worldwide applicability as a high-resolution chronostratigraphy. The Early Silurian CS is divisible into 12 conodont chronozones, 12 graptolite chronozones, and seven chitinozoa chronozones, most of which are defined in the same manner as previously recognized biozones for those taxa. The Telychian-early Sheinwoodian CS includes 28 bentonites, 17 of which occur in at least two sections belonging to the CS. Because only one bentonite has yielded a reliable radiometric date, the new CS cannot be scaled relative to absolute ages. In the Telychian-early Sheinwoodian CS, correlation of the conodont, graptolite, and chitinozoa chronozones comprising the CS compares favorably to recent correlation of Telychian-early Sheinwoodian conodont and graptolite zones (Männik, 2007) and conodont and chitinozoa zones (Kiipli et al., in press). The level for the base of the Wenlock in the Global Boundary Stratotype Section and Point for the base of the Wenlock, the Hughley Brook, Leasows, Great Britain section, graphically correlates to a position in the upper part of the *Cyrtograptus murchisoni* Chronozone, within the Upper *Pseudooneotodus bicornis* Chronozone (just above Datum 2 of the Ireviken Event), within the upper part of the *Margachitina margaritana* Chronozone, and just above the Ireviken Bentonite.

"I WANT MY DATA TO BE FOUND, AND USED" -- IMPROVING ACCESS TO PALEONTOLOGIC INFORMATION

HARRIS, Anita G.[1], STAMM, Nancy R.[2], SOLLER, David R.[2], JANCUSKA, Sarah N.[2], McMACKEN, Dennis K.[3], ACOSTA, Alex V.[3], and GISHEY, Michael F.[3] (1) U.S. Geological Survey, Emeritus, Deerfield Beach, FL 33441, ahcono@comcast.net, (2) U.S. Geological Survey, 926-A National Center, Reston, VA 20192, nstamm@usgs.gov, (3) U.S. Geological Survey, 920 N Park Avenue, Suite 106, Tucson, AZ 85719

For over one hundred years, USGS paleontologists have supplied essential biostratigraphic information to geologic mapping projects that range in focus from environmental to economic geology. Much of this valuable information was not included with the final map products, and remains unpublished. The paleontologic data, along with outcrop and borehole descriptions and measured sections, are an essential resource for geologic mapping and related sciences, both today and for the future. At present, these data are found in paper reports stored in filing cabinets. Clearly, their utility could be greatly expanded if they become more accessible, through the Web.

"I want my data to be found, and used." This sentiment is commonly expressed by retired paleontologists who anticipate that their data and interpretations can be useful for new science and mapping. Because much of this information is contained in their unpublished notes and records, we feel it is critically important to work closely with these scientists to identify the authoritative version of each piece of information, and then to present it on the Web, clearly and in a manner that preserves the author's intent. This can be done by providing scans of the paleontologist's records, supported by simple geographic and text searches. We have

begun to do this, as a component of the National Geologic Map Database (NGMDB, http://ngmdb.usgs.gov). The NGMDB is managed by the U.S. Geological Survey (USGS) and the state geological surveys, as a national archive of geoscience information that includes biostratigraphic data. When this information becomes available through the NGMDB, paleontologists and geologic mappers will be able to access the original biostratigraphic data more readily than is possible today, thereby expanding its use and value for science.

CONODONT BIOSTRATIGRAPHY AND STABLE ISOTOPE CHEMOSTRATIGRAPHY OF THE BROWNSPORT FORMATION (LUDFORDIAN, LUDLOW, SILURIAN), WEST-CENTRAL TENNESSEE

BARRICK, James E., Dept. of Geosciences, Texas Tech University, Lubbock, TX 79409-1053, jim.barrick@ttu.edu, GIBSON, Michael A., Agriculture, Geoscience, & Natural Resources, University of Tennessee at Martin, 256 Brehm Hall, Martin, TN 38238, and KLEFFNER, Mark A., Department of Geological Sciences, The Ohio State University at Lima, 4240 Campus Drive, Lima, OH 45804

The Upper Silurian Brownsport Formation of western Tennessee is well known for its abundant and diverse shelly fauna, but aspects of its internal stratigraphy remain uncertain and accurate age determinations of its members do not exist. Using conodont biostratigraphy and carbon isotope chemostratigraphy, we can resolve some of these problems, but the results raise new questions about the depositional history of the Brownsport Formation. The basal Beech River Member comprises green-gray to brown calcareous shales and argillaceous skeletal wackestone that may grade upward in some sections into an echinoderm packstone to grainstone facies assigned to the Bob Member. A diverse conodont fauna of the Ludfordian *Polygnathoides siluricus* Zone ranges through the Beech River Member. This fauna includes common *Panderodus unicostatus* and *P. recurvatus*, less common elements of *Ozarkodina confluens, Oulodus siluricus*, and *Po. siluricus*, and rare other species. Conodont elements are rare in more argillaceous strata and common in packstones and grainstones. In the western sections, darker gray argillaceous carbonate mudstones, packstones and shales (not typical of the Bob Member) overlie the Beech River section, within which occur the mid-Ludfordian Isotope Excursion and Lau Oceanic Event, which extend through 5 m of section and reaches values of $\delta^{13}C$ greater than +6‰. In eastern sections, however, the mid-Ludfordian Excursion ($\delta^{13}C$ +5‰) appears near the base of, and ranges through a 4- to 5-m section of coarse-grained echinoderm grainstones that overlie Beech River lithofacies. The *Po. siluricus* fauna disappears (start of the Lau Event) as the values of $\delta^{13}C$ start to rise from a short interval of negative values in both areas and a conodont fauna with *Wurmiella excavata, Dapsilodus, Decoriconus,* and rare *O. snajdri* is present. In both areas, strata that comprise the mid-Ludfordian Excursion and the overlying interbedded calcareous shale and packstone and grainstone of the Lobelville Member, yield only a few isolated elements of *W. excavata, Dapsilodus* or *Pseudooneotodus.* Only a few undiagnostic coniform elements have been recovered across the contact between the Lobelville Member and the low-insoluble-residue wackestone to packstone that forms the base of the overlying Decatur Formation.

REVIEW AND REVISION OF LATE SILURIAN SPATHOGNATHODONTID CONODONT TAXA OF THE SOUTH-CENTRAL UNITED STATES

PEAVEY, F. Nicole, Geosciences, Texas Tech University, Lubbock, TX 79409, fnreynaud@gmail.com

The Spathognathodontid family of conodonts produced several groups during the Late Silurian and Early Devonian with relatively conservative, carminate P1 elements. Because these forms tend to develop intergrading morphologies, they have resisted resolution into convenient, reliable taxonomic divisions. Study of collections from the south-central United States (Henryhouse and Haragan Formations, south-central Oklahoma; Frame Formation, west Texas; Bainbridge Formation, south-eastern Missouri; Decatur and Ross Formations, western Tennessee) has provided additional data to help both in the resolution of taxa and in the establishment of geographic and biostratigraphic ranges. At least four morphotypes of the complex *remscheidensis/eosteinhornensis* group have been identified, including the first recorded occurrence of “Ozarkodina” (New Genus W of Murphy et al.) *eosteinhornensis* in Oklahoma. P1 elements with incipient terraces on the basal cavity grade into forms that can possibly be assigned to “Ozarkodina” *planilingua*. Variation in P1 element denticle morphology within the *remscheidensis/eosteinhornensis* group ranges from fine, needle-like denticulation, through the majority of specimens with uniformly sized, triangular or palisade-like denticles, into specimens with extremely irregular denticulation that resemble, but differ from the P1 elements of the much younger species *Zieglerodina remscheidensis*. Other

Spathognathodontids include *Ozarkodina martinssoni auriformis* in Ludfordian strata and the *Oz. snajdri-crispa* transition crossing the Ludlow-Pridoli boundary interval. Preliminary comparisons with collections and published descriptions from Europe, Australia, and elsewhere in North America suggest that the Silurian and Devonian Spathognathodontidae may have some unutilized potential for correlation worldwide.

MIDDLE-UPPER DEVONIAN (LATE GIVETIAN-EARLY FAMENNIAN) CONODONT SEQUENCE IN THE SUBSURFACE OF SOUTHEASTERN IOWA: STRATIGRAPHIC CONDENSATION, LEAKS AND SUBMARINE EROSIONAL REWORKING ALONG THE WESTERN MARGIN OF THE ILLINOIS BASIN

DAY, Jed, Geography & Geology, Illinois State Univ, Normal, IL 61790-4400, jeday@ilstu.edu

In this study the conodont sequence is outlined as documented from continuous sampling at intervals ranging from 3 to 30 cm from the lower 80 samples taken through the upper part of the Cedar Valley Group (Coralville and Lithograph City fms.), “Sweetland Creek Shale” (=new un-named member of the Lime Creek Fm.), and Grassy Creek Shale in IGS Sullivan Slough Core from southeastern Iowa. In other well documented core (IGS IPSCO #3) and quarry sections in eastern Iowa, the Coralville Formation features conodonts of the Late Givetian Upper *Icriodus subterminus* Fauna. Conodonts from the Coralville in the Sullivan core include *Pandorinellina insita* indicating a stratigraphic leak of species of the *P. insita* Fauna into burrows or paleokarst cavities in the Coralville from the overlying Lithograph City Formation. Most of the overlying Andalusia Member of the Lithograph City yields shallow water conodonts of the latest Givetian-Early Frasnian *P. insita* Fauna, with *Ancyrodella alata* of Montagne Noire (M.N.) Zones 3 to 4 in the upper Andalusia, succeeded by faunas of M.N. Zone 4 in the Buffalo Heights Member. One upper Andalusia sample features mixed faunas of Early Frasnian M.N. Zones 4 and 10-11, evidence of a significant stratigraphic leak of Late Frasnian conodonts into paleokarst cavities in Early Frasnian carbonates (analogous to Independence Shale Leaks in eastern and central Iowa). Five feet of overlying hemipelagic carbonate mudstones and calcareous mudstone (“Sweetland Creek Shale") yields a highly condensed Late Frasnian sequence spanning M.N. zones 11 to 12, with Zone 13A faunas in the lower 1.8 feet of the Grassy Creek Shale. A cryptic disconformity in the Grassy Creek is indicated by faunas of the Middle *triangularis* Zone immediately above strata with M.N. Zone 13A faunas, evidence of submarine erosion of an interval spanning M.N. Zones 13B-13C and the Lower *triangularis* Zone. The overlying five feet (1.5 meters) of the Grassy Creek yield insitu Middle *triangularis* Zone faunas. Mixed faunas of M.N. Zone 13B are mixed with Middle *triangularis* Zone taxa in a sample associated with a pyritic lag in the lower Grassy Creek, and is evidence of a second submarine erosional horizon where very Late Frasnian conodonts were eroded from some other location, transported and admixed with insitu Early Famennian taxa.

CONODONTS AND OTHER FOSSILS FROM CORES IN THE RESURGE BRECCIA AT THE WEAUBLEAU IMPACT STRUCTURE, ST. CLAIR COUNTY, MISSOURI

MILLER, James F., Geography, Geology, and Planning, Missouri State University, Springfield, MO 65897, jimmiller@missouristate.edu, THOMPSON, Thomas L., Missouri Department of Natural Resources, Division of Geology and Land Survey, Rolla, MO 65402, and ETHINGTON, Raymond L., Geological Sciences Department, University of Missouri, 101 Geological Sciences Bldg, Columbia, MO 65211

The Weaubleau Structure (~5 miles in diameter) is an impact structure in west-central Missouri that displays several kinds of breccia. Carbonate resurge breccia, exposed in road cuts and a quarry, has abundant lithoclasts (chert, clay mudstone, limestone, dolomite) and bioclasts (conodonts, crinoid columnals and plates, blastoids, brachiopods, corals). Conodonts and intact crinoid and blastoid calyxes from breccia outcrops plus brachiopods, bryozoa, and trilobites from overlying chert residuum indicate a time of impact near the Osagean-Meramecian boundary. The Missouri Department of Transportation drilled five 2-inch-diameter cores into the breccia; the deepest core, 318 ft, is near the center of the structure. The resurge breccia is not bedded, and abundant clasts are like those found on outcrop. A burrowed sandstone clast 5.75 in long occurs 300 ft deep in the core. Intervals of coarse- and fine-grained breccia appear to be randomly arranged vertically, and some intervals appear to be thin, graded turbidites that record slumps from the sides of the impact crater. Above the breccia is 55 ft of chert residuum and Pennsylvanian gray shale. The core was split, and 1-ft samples collected at 20-ft intervals were dissolved to

recover conodonts. Most samples were productive, and Early Ordovician and Early and Middle Mississippian (Kinderhookian, Osagean) conodonts occur at random levels in the core. Taxa include many in breccia outcrops. Early Ordovician taxa are those known in the Jefferson City-Cotter Dolomite, including *Colaptoconus quadraplicatus*. Mississippian genera include *Gnathodus* (*G. texanus* is the most common conodont), *Hindeodus, Polygnathus, Pseudopolygnathus, Siphonodella,* and *Taphrognathus*. Two conodont elements, probably from the Upper Devonian Chattanooga Shale, were obtained in outcrop breccia samples, but the core yielded no Devonian fossils. Silicified crinoid stems and plates occur at the bottom and at several other levels in the core; probably these were derived from unconsolidated Burlington Limestone sediment. Faunas and clasts suggest that resurge and turbidity currents combined loose bottom sediments and fallback clasts to produce a heterogeneous breccia that has a mixed-age fauna. The base of the gray shale produced two typical Pennsylvanian pectiniform conodont elements.

NORTH AMERICAN REFERENCE SECTIONS FOR OSAGEAN CONODONT ZONATION

BOARDMAN, Darwin R. II, Geology Department, Oklahoma State University, 105 NRC, Stillwater, OK 74078, darwin.boardman@okstate.edu and THOMPSON, Thomas L., Missouri Department of Natural Resources, Division of Geology and Land Survey, Rolla, MO 65402

Two excellent distal shelf Osagean stratigraphic sections containing a continuous succession of conodonts of upper Kinderhookian-upper Osagean age from the Ozark Region in southwestern Missouri is presented. The first locality is the Roaring River State Park road-cut section on Missouri State Highway 112 first published by Branson and Mehl (1941). This section of some 40 meters comprises the Bachelor Formation, Compton Formation, Northview Formation, Pierson Formation, and the Reed Springs Formation. This section is the type locality for the type species of the following significant genera *Scaliognathus, Doliognathus*, and *Bactrognathus*. This locality is the type section for a number of Osagean conodont zonal name bearers including *Scaliognathus anchoralis* Branson and Mehl, *Doliognathus latus* Branson and Mehl , *Gnathodus bulbosus* Thompson and *Polygnathus mehli* Thompson. The Osagean part of the the Roaring River locality contains the *communis carina* Zone, *multistriatus* Zone, *anchoralis-latus* Zone, *distortus* Zone, *mehli* Zone, and the *bulbosus* zone.

A second exposure in southwestern Missouri is the magnificent new road-cut on US 71 at Jane, Missouri. This fifty meter section comprises the “Chattanooga” Shale, Bachelor Formation, Compton Formation, Northview Formation, Pierson Formation, and the Reed Springs Formation. In addition to the above zones, the *texanus* Zone is also present near the top of the Pierson Formation, thus yielding all Osagean conodont zones in one locality without any significant missing section.

These two sections taken collectively represent excellent North American reference sections in non-condensed open marine environments without any significant missing section. New undescribed taxa are also presented herein awaiting formal description.

CONODONTS FROM THE MAUCH CHUNK GROUP (CHESTERIAN), SOUTHERN WEST VIRGINIA, USA

REXROAD, Carl B., Indiana Geological Survey, 611 N. Walnut Grove Ave, Bloomington, IN 47405, crexroad@indiana.edu, BLAKE, Bascombe M. Jr, West Virginia Geological and Economic Survey, P.O. Box 879, Morgantown, WV 26507, and BEUTHIN, Jack D., Devon Energy Corporation, 20 N. Broadway, Oklahoma City, OK 73109

Seventy-five samples were collected from twelve marine-influenced named members in the Chesterian Bluefield, Hinton, and Bluestone Formations (Mauch Chunk Group) in extreme southern West Virginia to improve the correlation of these units and to further evaluate their paleoecology. Forty-six of the samples contained conodonts. The Mauch Chunk conodont fauna is typical of Chesterian rocks except that abundances are low and intraspecific variation is high. *Cavusgnathus* dominates the collection both in number of specimens and number of samples from which it was recovered. *Kladognathus* is next in abundance of specimens followed by *Gnathodus, Hindeodus*, *Lochriea*, *Hindeodontoides*, and *Vogelgnathus*.

The dominance of *Cavusgnathus* suggests a mostly nearshore environment with variable salinity, energy, and sediment load. *Kladognathus, Gnathodus, and Hindeodus* show a preference for relatively normal salinity, however, and their varying association with *Cavusgnathus* suggests local and temporary intervals of greater environmental stability. *Gnathodus, Hindeodus, Kladognathus, Lochriea*, and *Vogelgnathus* are most abundant in one of the samples in the Pride Shale Member (Bluestone Formation), the most nearly

open marine of our samples.

The discrepancies in Illinois Basin conodont ranges as compared with other areas in combination with the relative paucity of conodonts in this study make correlation with the type Chesterian difficult, and so our overall correlation is based on limited conodont evidence. In the Illinois Basin, *Cavusgnathus naviculus* occurs first in the Menard Limestone and in West Virginia in the Avis Limestone Member (Hinton Formation). *C. monoceras,* commonly referred to *Adetognathus unicornis*, is present in the Clore Formation, Kinkaid Limestone, and Grove Church Shale in the Illinois Basin and in the Pride and the Bramwell Member (Bluestone Formation) in West Virginia, thus supporting the correlation of those units. Species of *Gnathodus* in the Pride and Bramwell are absent in the Illinois Basin but co-occur in other parts of the world very high in the Serpukhovian (Chesterian) just into the Bashkirian.

LITHOSTRATIGRAPHY AND CONODONT BIOSTRATIGRAPHY OF THE UPPER MISSISSIPPIAN TAHLEQUAH MEMBER, MOOREFIELD FORMATION BASED ON THE TYPE LOCALITY

GODWIN Cory, Boone Pickens School of Geology, Oklahoma State University, 105 Noble Research Center, Stillwater, OK 74078-3031, cory.godwin@okstate.edu, BOARDMAN, Darwin R. II, Geology Department, Oklahoma State University, 105 NRC, Stillwater, OK 74078, MAZZULLO, Salvatore J., Department of Geology, Wichita State University, Wichita, KS 67260, and WILHITE, Brian W., Woolsey Operating Co., LLC, 125 North Market, Suite 1000, Wichita, KS 67202

The Tahlequah Member (Meramecian) is the lowermost unit within the Mayes Group of northeastern Oklahoma as defined by Dr. George Huffman in 1958. The type section is located along Tahlequah Creek in Section 4 of Township 16 North, Range 22 East within the city limits of Tahlequah, Oklahoma. An adjacent exposure was measured, described and sample in detail. The Tahlequah Member overlies the Osagean Keokuk Formation and Short Creek Oolite with apparent unconformity. It is overlain conformably by the Bayou Manard Member of the Mayes Group. The Tahlequah Member is composed of gray, medium to coarse-grained glauconitic limestone and interbedded calcareous shale. Beds within the Tahlequah Member occur as a succession of clinoforms that thicken away from a Keokuk paleotopographic high.
The age of the Tahlequah Limestone has been controversial for some time. Huffman (1958) correlated the Tahlequah Member to the Warsaw Limestone, Meramecian of the Midcontinent. Brenkle and Lane (1974) concluded that the Tahlequah and Bayou Manard members were younger than the Warsaw and of St. Louis age. This was based on the occurrence of unspecified conodonts from the *Apatognathus scalensus-Cavusgnathus* Zone along with *Gnathodus homopunctatus* from those units.
The current study from the type area demonstrates conclusively that the Tahlequah Limestone belongs to the *Gnathodus texanus-Taphrognathus varians* Zone based on the co-occurrence of these two species. These conclusions therefore support correlation of the Tahlequah Limestone with the Warsaw.

A COMPARISON OF *IDIOGNATHODUS* FAUNAS FROM THE UPPER SALESVILLE SHALE OF NORTH-CENTRAL TEXAS AND THE HUSHPUCKNEY SHALE OF OKLAHOMA, KANSAS, AND NEBRASKA

ROSSCOE, Steven J., Geological and Environmental Sciences, Hardin-Simmons University, 2200 Hickory Street, Abilene, TX 79605, srosscoe@hsutx.edu and BADER, Jeremy D., Halliburton Energy Services, 4000 N. Big Spring, Suite 240, Midland, TX 79705, jeremy.bader@halliburton.com

Detailed collections of the Upper Salesville Shale from North-Central Texas and the Hushpuckney Shale of Kansas and adjacent states (Midcontinent Basin) have yielded correlative conodont faunas. A taxonomic system using characters of functional significance and biometrics was used to compare the *Idiognathodus* species of the two faunas. The Midcontinent fauna has a higher species diversity than the Texas fauna, but key species for correlation have been identified in both regions. *Idiognathodus swadei* and *I. cancellosus* are present in both the Midcontinent and Texas faunas. *Idiognathodus cancellosus* is restricted to the Hushpuckney Shale (Swope Cyclothem) and the overlying Stark Shale (Dennis Cyclothem) in the Midcontinent Basin. *Idiognathodus swadei* is not present in the Stark Shale, while it is found in the Hushpuckney Shale. The presence of both *I. swadei* and *I. cancellosus* in the Upper Salesville Shale confirms the correlation to the Hushpuckney Shale (Swope Cyclothem) of the Midcontinent.
Study of idiognathodid conodonts in the Midcontinent Hushpuckney Shale indicates three populations within the basin. A basinal population (Oklahoma), a high shelf population (Nebraska) and a lower-mid

shelf mixed population (Kansas) have been identified using the dominance of *Idiognathodus* species characteristic within each population. The basinal population is dominated by specimens with reduced or missing accessory lobes including *I. cancellosus, I. corrugatus,* and *I. folium*. Other species present include *I. sulciferus, I. swadei, I. lobatus, I. biliratus, I. clavatulus, I. turbatus* and *I. siculus*. The high shelf population is dominated mostly by species with robust accessory lobes including *I. sulciferus, I. cancellosus* (reduced lobes)*,* and *I. swadei.* The high shelf population contains the other species found in the basinal population, with the notable absence of *I. biliratus*. The lower-mid shelf mixed population is dominated by *I. corrugatus, I. cancellosus, I. swadei, and I. sulciferus* and shares the same species as the basinal population, including *I. biliratus*. The Upper Salesville Shale fauna is most similar to the high shelf population in that it is dominated by *I. sulciferus, I. swadei,* and *I. cancellosus*. The lack of *I. biliratus* in the Upper Salesville Shale further supports this relationship.

PENNSYLVANIAN CONODONT BIOSTRATIGRAPHY OF THE PARADOX BASIN

RITTER, Scott, Dept. of Geological Sciences, Brigham Young University, S-389 ESC, Provo, UT 84602, scott_ritter@byu.edu and BARRICK, James E., Department of Geosciences, Texas Tech Univ, Lubbock, TX 79409-1053

Idiognathodus- Neognathodus- and Streptognathodus-dominated conodont faunas occur in 19 of 53 fifth-order parasequences (depositional cycles) that comprise the upper Paradox and Honaker Trail Formations at Honaker Trail, Utah. Conodont elements are moderately common in maximum trangressive facies, but are rare to absent in intervening, and relatively thicker, shallow marine and non-marine beds. This patchy stratigraphic distribution, controlled principally by glacio-eustatic cyclicity, precludes subdivision of the section into contiguous range zones whose boundaries are based upon the "evolutionary" first occurrences of new species. Instead, conodonts are used as biotic signatures to distinguish individual parasequences or parasequence sets from others in a vertical succession. This sequence biostratigraphic approach 1) permits fingerprinting of selected Paradox basin cycles and 2) provides a means of matching Paradox basin cycles to their Midcontinent equivalents. Missourian conodont species (Idiognathodus eccentricus, I. sulciferus, and I. sp. A of Barrick et al.) first occur 56 meters above the base of the Honaker Trail Formation. Conocont occurrences in selected horizons of the Hermosa Group in Colorado, permits correlation of key horizons from the Southwest Shelf to the mixed carbonate-siliciclast sections on the Northeast Shelf near Durango, Colorado.

June 28–July 3, 2010, Conodont papers at the third International Palaeontological Congress (IPC3), London, U.K.

IPC3 was a large and, if I perceived correctly, successful meeting with around 800 delegates from about 50 countries. Thus it was one of the biggest gatherings of professional palaeontologists ever held. Conodonts were very well represented in the programme. In particular, Steve Leslie organised an excellent workshop on 'How conodonts lived and ate: food processing functions of conodont elements', during which old and new data and views were forwarded, engendering lively discussion. In the afternoon following this workshop, microscopes were available and there was the opportunity to discuss specimens, with the focus on those used to identify Devonian and early Carboniferous boundaries and on the structure of Ordovician conodont apparatuses.

But conodonts also featured widely elsewhere. In all, 32 of the presentations included 'conodont' in their titles, spread across nine separate symposia as well as the workshop. Another 38 abstracts mentioned conodonts. Numerous members of the Pander Society were present at the meeting, including the Chief Panderer, and the Congress, therefore, hosted innumerable Pander Society meetings (under the definition that these comprise any occasion when three or more conodont workers get together to talk about conodonts).

All the abstracts for IPC3 can be found at http://www.ipc3.org/

Dick Aldridge

Abstracts involving conodonts presented at the IPC3

S9 - MIDDLE/UPPER DEVONIAN BOUNDARY CONODONT FAUNAS FROM GIEBRINGHAUSEN (RHENISH MASSIF, GERMANY)
Aboussalam, Z. Sarah and Becker, R. Thomas

S5 - THE UNIVERSITY OF IOWA PALEONTOLOGY REPOSITORY DIGITIZATION PROJECT
Adrain, Tiffany S., Budd, Ann, F. and Adrain, Jonathan, M.

S8 - THE CAMBRIAN-ORDOVICIAN BOUNDARY IN SOUTH AMERICA: HIGH RESOLUTION BIOSTRATIGRAPHY, GLOBAL CORRELATION AND PALEOENVIRONMENTS
Albanesi, Guillermo L., Ortega, Gladys, Zeballo, Fernando J. and Pacheco, Fernanda E.

S15 - RECONSTRUCTING ORDOVICIAN CLIMATE FROM THE DISTRIBUTION OF RADIOLARIAN CHERTS: WAS COOLING THE CAUSE OF THE GREAT ORDOVICIAN BIODIVERSIFICATION?
Armstrong, Howard A. and Vandenbroucke, Thijs R. A.

S9 - CONODONTS IMPRINTS FROM VOLCANOGENIC-SILICEOUS DEPOSITS – AN IMPORTANT PALAEONTOLOGICAL BASE FOR BIOSTRATIGRAPHICAL SUBDIVISIONS IN FOLDED AREAS
Artyushkova, Olga V. and Maslov, Victor A.

S9 - MIDDLE AND UPPER DEVONIAN OSTRACODS FROM THE SALAIR AND KUZNETSK BASIN, RUSSIA
Bakharev, Nikolay K.

S15 - THE ONSET OF THE CARBONIFEROUS GLACIATION – STABLE ISOTOPE EVIDENCE FROM IRELAND
Barham, Milo, Murray, John and Williams, D. Michael

S9 - AN UPDATE OF MIDDLE/UPPER DEVONIAN GLOBAL EVENTS IN SOUTHERN MOROCCO
Becker, R. Thomas, Aboussalam, Z. Sarah, Hartenfels, Sven and El Hassani, Ahmed

S23 - PRECISE COINCIDENCE OF MASS EXTINCTION AND VOLCANISM IN THE MIDDLE PERMIAN OF CHINA: MICROFOSSIL AND CARBON ISOTOPE RECORDS FROM THE EMEISHAN LIP
Bond, D. P. G., Wignall, P. B., Sun, Y.-D., Lai, X.-L., Jiang, H.-S., Wang, W.

S23 - PRECISE COINCIDENCE OF MASS EXTINCTION AND VOLCANISM IN THE MIDDLE PERMIAN OF CHINA: MICROFOSSIL AND CARBON ISOTOPE RECORDS FROM THE EMEISHAN LIP
Bond, D. P. G., Wignall, P. B., Sun, Y.-D., Lai, X.-L., Jiang, H.-S., Wang, W.

S3 - MIDDLE-UPPER DEVONIAN AND LOWER CARBONIFEROUS CONODONTS FROM THE ISTANBUL ZONE, NW TURKEY
Çapkinoğlu, Şenol

S9 - CONODONT GENUS *PROTOGNATHODUS* AS A POSSIBLE TOOL FOR RECOGNIZING THE DEVONIAN/CARBONIFEROUS BOUNDARY
Corradini, Carlo, Kaiser, Sandra I., Perri, Maria Cristina and Spalletta, Claudia

S26 - HIRNANTIAN (LATEST ORDOVICIAN) EVENT IN THE CENTRE OF NORTH AMERICA? COLOUR, CARBON ISOTOPIC EXCURSION, AND CONODONT TURNOVER
Demski, Matthew W., Stewart, Lori A., Elias, Robert J., Young, Graham A., Nowlan, Godfrey S. and Dobrzanski, Edward P.

S13 - CHANGES IN THE STYLE OF CARBONATE PRODUCTION IN THE TROPICS DURING THE END-ORDOVICIAN GLACIATION
Desrochers, André, Long, D.G.F. and Farley, Claude

S8 - GONDWANA TO BALTICA TO AVALONIA TO LAURENTIA: *IOCRINUS* HALL (DISPARIDA), A GLOBETROTTING CRINOID IN THE ORDOVICIAN
Donovan, Stephen K., Miller, C. Giles, Sansom, Ivan J., Heward, Alan and Shreurs, Jan

W6 - VERTEBRATE HOMOLOGIES AND ANALOGIES IN THE CONODONT ORAL APPARATUS
Dzik, Jerzy

S26 - GEOCHEMICAL RECORD OF MARINE ANOXIA DURING THE IREVIKEN EVENT
Emsbo, Poul, Munnecke, Axel, Breit, George N., Koenig, Alan E., McLaughlin, Patrick I., Jeppsson, Lennart and Verplanck, Philip L.

S13 - OSTRACODES (CRUSTACEA) WITNESSES OF PALEOENVIRONMENTAL MODIFICATIONS ASSOCIATED WITH PERMIAN-TRIASSIC BOUNDARY EVENTS IN THE PALEO-TETHYS OCEAN
Forel, Marie-Béatrice and Crasquin, Sylvie

W6 - CONODONTS, WERE THEY (THE FIRST?) PARASITIC ANIMALS?
Gedik, İsmet

S3 - EVOLUTION OF CONODONTS OF THE LATE PENNSYLVANIAN IN THE MOSCOW SYNECLISE (RUSSIA)
Goreva, Natalia V.

W6 - USING CONODONT PALEOECOLOGY AND ISOTOPE GEOCHEMISTRY TO ASSESS IF A VOLCANIC MEGA-ERUPTION CAUSED GLOBAL COOLING DURING THE LATE ORDOVICIAN
Hermann, Achim D., MacLeod, Kenneth G., and Leslie, Stephen A.

S5 - PALAEONTOLOGICAL COLLECTIONS IN ESTONIA: AN EXAMPLE OF DEVELOPMENT OF NATIONAL COLLECTION MANAGEMENT SOFTWARE
Hints, Olle, Isakar, Mare and Hints, Rutt

S26 - THE SILURIAN NAUTILOID FAUNAS OF THE CELLON SECTION (CARNIC ALPS, AUSTRIA): COLOUR VARIATION RELATED TO EVENTS
Histon, Kathleen.

S23 - A NEW EXCEPTIONALLY PRESERVED BIOTA FROM THE MIDDLE TRIASSIC OF SW CHINA
Hu Shixue, Zhang Qiyue, Zhou Changyong, Lv Tao, Xie Tao and Wen Wen

S9 - UPPER DEVONIAN CONODONTS OF WEST SIBERIA, RUSSIA
Izokh, Nadezhda G.

S10 - VARIATIONS IN ALGAE AND BACTERIA DURING THE END-PERMIAN BIOTIC CRISIS IN THE BULLA SECTION, ITALY
Jia Chengling, Huang Junhua, Farabegoli, Enzo, Perri, M. Cristina and Xie Shucheng

S17 - FUNCTIONAL MORPHOLOGY OF THE EARLIEST VERTEBRATE FEEDING STRUCTURES
Jones, David and Evans, Alistair

S13 - DEAD BELLEROPHONTIDS WALKING – THE SHORT MESOZOIC HISTORY OF THE BELLEROPHONTOIDEA (GASTROPODA)
Kaim, Andrzej and Nutzel, Alexander

S8 - KATIAN BIODIVERSITY – A PRELUDE TO THE HIRNANTIAN (ORDOVICIAN) MASS

EXTINCTION AS SEEN FROM BALTIC DATA
Kaljo, Dimitri, Hints, Linda, Hints, Olle, MaÅNnnik, Peep, Martma, Tonu and Nolvak, Jaak

S9 - EARLY DEVONIAN (PRAGIAN-EMSIAN) BIODIVERSITY PATTERN IN ZINZILBAN AND KHODZHAKURGAN SECTIONS, ZERAFSHAN RANGE, SOUTH TIEN SHAN
Kim, Aleksey I., Erina, Maya V., Kim, Irina A., Salimova, Firuza A., Meshchankina, Natalya A., Karimova, Firdaus S. and Rahmonov, U.D.

S9 - KONZENTRAT LAÅNGERSTATTE OF THE GONIATITE *NAPLESITES* MARKING A GLOBAL TRANSGRESSSION EVENT (UPPER DEVONIAN, *MESOBELOCERAS* GENOZONE) IN THE RHINESTREET SHALE, WESTERN NEW YORK
Kirchgasser, William T., Baird, Gordon C., Over, D. Jeffrey, Brett, Carlton E. and Becker, R. Thomas

S13 - A NEWLY DISCOVERED EARLY TRIASSIC CHERT AT GAIMAO SECTION, GUZHOU, SOUTHWESTERN CHINA
Lai Xulong, Yang Bo and Jiang Haishui

S23 - CAMBRIAN *MONGOLITUBULUS*-LIKE SCLERITES: SPINES OF DIFFERENT ARTHROPOD FOSSILS
Li Guoxiang, Steiner, Michael and Zhu Maoyan1

W10 - SPORES, LIFE, DEATH AND THE DEVONIAN EARTH SYSTEM
Marshall, John E. A., Astin, Tim R. and Tel'nova, Olga P.

S6 – LARGE SCALE PALAEONTOLOGIAL DATA ANALYSIS OF CONODONT FOSSIL HISTORY
Martínez-Pérez, C., Botella, H. and Cascales-Miñana, B.

W6 - FINITE ELEMENTS ANALYSIS OF CONODONT ELEMENT FUNCTION
Martínez-Pérez, Carlos, Donoghue, Philip C.J. and Rayfield, Emily J.

S9 - DEVONIAN–CARBONIFEROUS BOUNDARY IN POLAND: CONODONT AND MIOSPORE SUCCESSIONS AND EVENT STRATIGRAPHY
Matyja, Hanna, Malkowski, Krzysztof, Sobien, Katarzyna and Stempien-Salek, Marzena

S4 - REVISION OF THE CARNIAN/NORIAN CONODONTS THROUGH THE APPLICATION OF CLADISTIC ANALYSIS
Mazza, Michele, Cau, Andrea and Rigo, Manuel

W6 - POSSIBLE INFLUENCE OF THE δ13C VARIATIONS ON THE CARNIAN/NORIAN CONODONTS DIFFUSION
Mazza, Michele, Rigo, Manuel, Furin, Stefano and Spötl, Christoph

S27D - A BATHYURID BIOFACIES (TRILOBITA) FROM THE LOWER ORDOVICIAN (IBEX, TULEAN) SEPTEMBERSØ FORMATION, NORTH-EAST GREENLAND
McCobb, Lucy M. E., Boyce, W. Douglas, Knight, Ian and Stouge, Svend

S26 - FAUNAL CHANGES AND HI-RES BIOSTRATIGRAPHY THROUGH A COLOUR-SHIFTING LIMESTONE SEQUENCE: THE UNRAVELLING OF A MIDDLE ORDOVICIAN ECO-EVENT IN BALTOSCANDIA
Mellgren, Johanna I. S., Eriksson, Mats E. and Schmitz, Birger

S7 - PLICATHYRIDINE BRACHIOPODS FROM THE FRASNIAN (UPPER DEVONIAN) OF THE MIDDLE EAST AND BELGIUM
Mottequin, Bernard and Brice, Denise

THE ORIGIN OF THE CONODONT SKELETON
Murdock, Duncan J.E., Donoghue, Philip C.J., Bengtson, Stefan and Stampanoni, Marco

W6 - VARIETY IN CONODONT ELEMENT MORPHOLOGY AND APPARATUS STRUCTURE, CAMBRIAN TO TRIASSIC, A REFLECTION OF DIFFERENT PREY AND FEEDING STRATEGIES
Nicoll, Robert S. and Leslie, Stephen A.

S9 - AMMONOIDS AND CONODONTS FROM THE FRASNIAN AND FAMENNIAN OF THE WESTERN SLOPE OF THE SOUTH URALS: STRATIGRAPHY AND PALEOGEOGRAPHY
Nikolaeva, Svetlana and Pazukhin, Vladimir

S9 - UPPER DEVONIAN RADIOLARIANS FROM THE ZERAVSHAN-GISSAR MOUNTAINOUS AREA (UZBEKISTAN REPUBLIC)
Obut, Olga T. and Izokh, Nadezhda G.

S8 - GRAPTOLITE AND CONODONT FAUNAS FROM THE MIDDLE-UPPER ORDOVICIAN SIERRA DE
LA INVERNADA FORMATION, CENTRAL PRECORDILLERA OF SAN JUAN, ARGENTINA
Ortega, Gladys, Albanesi, Guillermo L., Bejerman, Agustin, Voldman, Gustavo G. and Banchig, Aldo L.

S9 - CONODONTS AND FORAMINIFERS FROM THE DEVONIAN/CARBONIFEROUS BOUNDARY BEDS IN THE SOUTH URALS
Pazukhin, Vladimir N. and Kulagina, Elena I.

S26 - BIOTIC CHARACTERISTICS OF DEEP-WATER CHERTS IN THE ORDOVICIAN OF EASTERN AUSTRALIA, AND THEIR CORRELATIVES IN KAZAKHSTAN AND SCOTLAND
Percival, Ian G.

S9 – WHAT IS THE IMPACT OF THE TAGHANIC EVENT ON TABULATE CORALS OF THE ARDENNES?
Pinte, Emilie and Mistiaen, Bruno

S13 - RECOVERY OF CONODONTS AFTER THE PERMIAN EXTINCTION
Plasencia, Pablo and Márquez-Aliaga, Ana

W6 - FUNCTIONAL APPROACH TO THE TRIASSIC CONODONT SPECIES *PSEUDOFURNISHIUS MURCIANUS* VAN DEN BOOGAARD
Plasencia, Pablo and Martínez-Pérez, Carlos

S3 - RECENT STUDY OF CONODONTS AND FORAMINIFERS FROM THE CANDIDATE GSSP OF THE CARBONIFEROUS VISEAN-SERPUKHOVIAN BOUNDARY IN THE NAQING (NASHUI) SECTION OF SOUTH CHINA
QiYuping, Wang Xiangdong, Richards, Barry C., Groves, John R., Ueno, Katsumi and Wu Xianghe

W6 - LATE TRIASSIC CONODONT LIFESTYLE: CONSTRAINTS FROM OXYGEN ISOTOPES OF BIOGENIC APATITE
Rigo, Manuel and Joachimski, M. Michael

W6 - Sr ISOTOPIC SHIFT AS A POTENTIAL GLOBAL GEOCHEMICAL MARKER FOR THE BASE OF THE RHAETIAN STAGE
Rigo, Manuel, Callegaro, Sara, Chiaradia, Massimo, Orchard, Michael, Marzoli, Andrea1

S13 - THE EFFECT OF THE LATE LUDFORDIAN LAU EVENT ON THE CONODONT FAUNAS FROM BOHEMIA
Slavík, Ladislav

S20 - CAMBRIAN SMALL SHELLY FOSSILS AND THE TAPHONOMIC PHOSPHATIZATION WINDOW
Steiner, Michael and Li Guoxiang

S13 - LATE LUDLOW *KOZLOWSKII* EVENT IN BOHEMIA: GRAPTOLITE RECORD COMBINED WITH CONODONT, SEDIMENTARY AND CARBON ISOTOPE DATA
Štorch, Petr, Slavík, Ladislav, Manda, Štěpán and Frýda, Jiří

S9 - CONODONT BIOFACIES AND PALAEOENVIRONMENT: A CASE STUDY FOR THE MIDDLE AND UPPER DEVONIAN OF THE SPANISH CENTRAL PYRENEES
Valenzuela-Ríos, José I. and Liao, Jau-Chyn

S9 - PYRENEAN CONODONTS AS A RELEVANT TOOL FOR EVALUATING THE PRAGIAN/EMSIAN (LOWER DEVONIAN) BOUNDARY CONCEPTS
Valenzuela-Ríos, José I. and Martínez-Pérez, Carlos

S26 - COLOUR CHANGE AND GLOBAL EVENTS, A HOAX? A CASE STUDY FROM THE LOCHKOVIAN (LOWER DEVONIAN) IN THE SPANISH CENTRAL PYRENEES
Valenzuela-Ríos, José I.

S15 - DRILLING THE EYES OUT OF TRILOBITES: FIRST RESULTS FROM STABLE ISOTOPE ANALYSES OF ORDOVICIAN *CAROLINITES*
Vandenbroucke, Thijs R. A., Williams, Mark, Leng, Melanie, Fortey, Richard A., Andrews, Julian E., Torney, Clare, Page, Alex A., Armstrong, Howard A. and Owen, Alan W.

S27B - PERMIAN FORAMINIFERA AND CONODONTS (ARTINSKIAN-MURGABIAN) FROM THE RUTEH FORMATION IN THE HIV AREA, CENTRAL ALBORZ, NORTH IRAN
Vaziri, Seyed Hamid, Hamdi, Bahaedin and Rangriz-Azarfam, Farideh

S3 - CONODONTS AS PALAEOTHERMOMETERS IN ANCIENT OCEANS: TESTS AND LIMITATIONS
Wheeley, James R., Smith, M. Paul and Boomer, Ian

S23 - ORDOVICIAN CONODONT DIVERSIFICATION IN THE LOWER YANGTZE VALLEY
Wu Rongchang, Wang Zhihao and Stouge, Svend

S23 - BIODIVERSITY PATTERNS OF LOWER - MIDDLE ORDOVICIAN MARINE MICROPHYTOPLANKTON IN SOUTH CHINA: RELATION TO THE EVOLUTION OF THE MARINE INVERTEBRATES
Yan Kui, Servais, Thomas and Li Jun

The Chief Panderer apologizes if any conodont-bearing or conodont-related abstracts, were missed in this or any other meeting.

Upcoming Meetings

August 30–September 2, 2010, 4th French Congress on Stratigraphy, Paris, France is being hosted by the Université Pierre et Marie Curie - Paris 6. Three scientific sessions are of interest to conodont workers:
1. "Refining the Palaeozoic time scale: recent advances and ongoing problems in both regional and international correlations",
2. "Interactions between Palaeozoic stratigraphy, palaeontology, palaeogeography and climates",
3. "GSSPs and stratotypes".

(submitted by Carine Randon) Congress website: http://paleopolis.rediris.es/STRATI2010/index.html

September 20–24, 2010, "Second Symposium on Biostratigraphy and Events of the Lower Paleozoic", La Plata City, Argentina. It is part of the "Tenth Argentinean Congress of Paleontology and Biostratigraphy and the Seventh Latin American Congress of Paleontology".
Conveners are Guillermo Albanesi and Gladys Ortega.
Contacts: galbanes@com.uncor.edu, gcortega@arnet.com.ar

(submitted by Guillermo Albanesi) Congress website: http://www.congresospaleo2010.fcnym.unlp.edu.ar

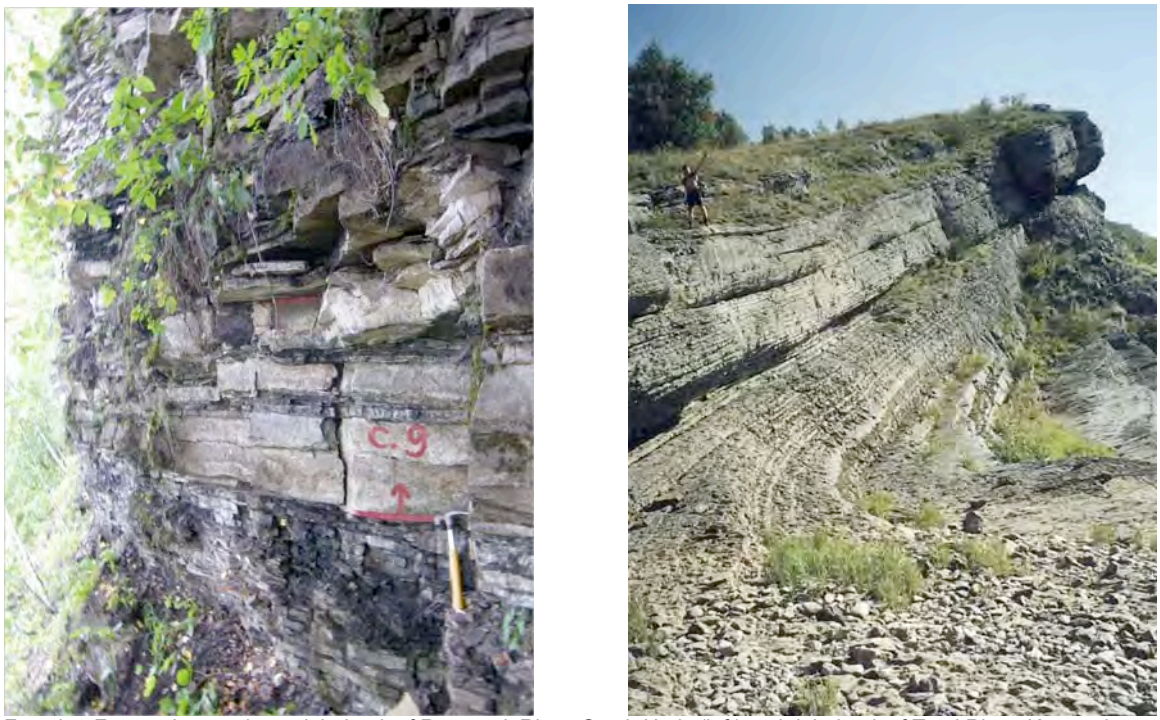
Future Meetings

July 20–August 10, 2011, "Middle to Upper Devonian and Lower Carboniferous Biostratigraphy of the South Urals and Kuznetsk Basin", Novosibirsk, Russia

This International Conference is dedicated to the memory of Yevgeny Aleksandrovich Yolkin. It includes a *Devonian Subcommission meeting*. The highlight is the **Pre-and Post-conference excursions** to the South Urals and Kuznetsk Basin (south-western Siberia) where richly fossiliferous Middle to Upper Devonian and Lower Carboniferous marine sequences in terrigenous, reef carbonate, and volcanic facies will be demonstrated.

Main aims of the meeting: 1) to demonstrate reference sections and discuss in the field inter-regional correlation (lithologic and biostratigraphic) levels of Kuznetsk Basin and South Urals Devonian marine basins; 2) brief introduction of reference transitional Upper Devonian-Lower Carboniferous sequences of the Kuznetsk Basin and South Urals Paleozoic marine basins.
Proposal about the conference was approved during the Subcommission on Devonian Stratigraphy and IGCP 499 business meetings in the Kitab State Geological Reserve (Uzbekistan Republic) (September, 2008).

Pre-and Post-conference field excursion will be held in the South Urals and Kuznetsk Basin (south of West Siberia) for 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.



Frasnian-Famennian sections: right bank of Ryauzyak River, South Urals (left) and right bank of Tom' River, Kusnetsk Basin (SW Siberia) (right; yodeling geologist for scale).

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

Secretary e-mail: devon@ipgg.nsc.ru

(submitted by Nadezhda Izokh and Olga Obut) Congress webside: http://www.ipgg.nsc.ru

July, 2013, International Conodont Symposium, ICOS 2013, Mendoza, Argentina
Guillermo Albanesi, on behalf of the organizing committee, invites all conodont workers to the next ICOS. It will be held in Mendoza, with San Juan and Salta as headquarters for the pre- and post-symposium field trips to the Precordillera and Eastern Cordillera respectively. An intra-symposium field trip to the Mendoza Precordillera is foreshadowed.

(submitted by Guillermo Albanesi)

Research Interests

Asterisk: no report for 2010, information from the Newsletter 2009*

Cambrian Bagnoli; Dong; Donoghue; Kozur; Lehnert*; Leslie; Miller (J.F.); Nowlan; Pyle*; Qi; Repetski; Sansom*; Smith; Spencer*; Szaniawski
Ordovician; Albanesi; Aldridge; Alekseev; Armstrong*; Bagnoli; Bancroft*; Barnes; Bauer; Bergström; Dong; Dzik; Ethington; Ferretti; Hall; Izokh; Kozur; Leatham; Lehnert*; Leslie; Liu*; Löfgren; Männik; McCracken; McHargue*; Miller (C.G.); Miller (J.F.); Nicoll; Nowlan; Percival; Pyle*; Reimers*; Repetski; Sandberg; Sansom*; Sarmiento; Savage; Smith; Spencer*; Suttner; Sweet; Szaniawski; Tarabukin*; Viira; Wu (Rongchang)*; Zhang (Shunxin); Zhen
Silurian Aldridge; Bader; Bancroft*; Bardashev; Barnes; Barrick; Bergström; Boncheva; Corradini; Corriga; Garcia- Lopez; Izokh; Jeppsson; Kleffner; Kozur; Leatham; Leslie; Männik; McCracken; Meço; Miller (C.G.); Molloy; Nowlan; Percival; Sanz-López; Sarmiento; Savage; Simpson; Slavik; Suttner; Talent; Viira; von Bitter; Wang
S/D boundary Corriga; Hairapetian*; Lehnert*; Metzger*; Pyle*; Sansom*; Sashida*; Talent; Tarabukin*; Valenzuela-Ríos*
Devonian Alekseev; Artyushkova; Bardashev; Barrick; Belka; Bender*; Berkyova*; Bikbaev*; Boncheva; Bultynck; Castello*; Corradini; Corriga; Day*; Dopieralska; Dusar; Dzik; Furey-Greig; Garcia-Lopez; Gatovsky; Gholamalian; Girard*; Gouwy*; Groessens; Herbig; Izokh; Johnston; Kaiser; Katvala*; Kirchgasser; Kirilishina*; Klapper; Königshof; Kononova*; Kozur; Leatham; Liao*; Luppold; McCracken; Machado*; Maslov*; Mathieson; Matyja; Mawson; Meço; Metzger*; Miller (C.G.); Molloy; Murphy*; Narkiewicz; Navas-Parejo; Nazarova*; Obut; Over; Perri; Piecha; Pondrelli; Pyle*; Randon; Repetski; Ruppel*; Sandberg; Sanz-López; Savage; Saydam-Demiray*; Simpson; Slavik; Sloan; Snigireva*; Spalletta; Suttner; Szaniawski; Talent; Tarabukin*; Uyeno; Valenzuela-Ríos*; Wang; Wankiewicz; Woroncowa-Marcinowska; Zhuravlev
Frasnian-Famennian boundary Bikbaev*; Castello*; Gatovsky; Kirilishina*; Luppold; Perri; Snigireva*; Spalletta
D/C boundary Corradini; Gatovsky; Kaiser; Matyja; Perri; Spalletta
Carboniferous Alekseev; Bardasheva; Barrick; Belka; Bender*; Boncheva; Corradini; Dopieralska; Dusar; Dumoulin; Garcia-López; Gatovsky; Groessens; Henderson; Herbig; Hisayoshi (Igo)*; Ishida; Jones (G.L.)*; Kozur; Kononova*; Krumhardt*; Lambert*; Lang; Méndez; Nazarova*; Nemyrovska; Nicora; Norby; Orchard; Park; Perri; Piecha; Purnell; Qi; Randon; Reimers*; Rexroad; Sanz-López; Sevastopulo; Spalletta; Tarabukin*; Wang; Wardlaw; Whiteside*; Zhuravlev
Mississippian Blanco-Ferrera*; Johnston; Matyja; Medina-Varea*; Matyja; Norby; Rexroad; Ruppel*; Sandberg; Sudar; von Bitter
Pennsylvanian Bader; Barrick; Blanco-Ferrera*; Brown; Heckel; Méndez; Merrill; Pieracacos; Rexroad; Rosscoe*; Salinas*; Sandberg; Scomazzon; von Bitter
Permian Alekseev; Dumoulin; Henderson; Hisayoshi; Ishida; Jiang; Kozur; Lambert*; Nakrem; Nicoll; Nicora; Orchard; Park; Perri; Qi; Reimers*; Ruppel*; Sandberg; Shen; Takahashi; Wang; Wardlaw; Zhuravlev
Permian-Triassic Interval Aldridge; Metcalfe*
P/T boundary Goudemand; Henderson; Isozaki; Jiang; Kolar-Jurkovšek; Lai; Metcalfe *; Paull*; Perri; Sweet
Triassic Alekseev; Dumoulin; Golding; Goudemand; Henderson; Hirsch*; Hisayoshi; Ishida; Jiang; Kaiser; Katvala*; Kolar-Jurkovšek; Kiliç*; Kovacs*; Kozur; Leatham; Liu*; Marquez Aliaga; Mastandrea; Meço; Mikami; Narkiewicz; Nicoll; Nicora; Orchard; Perri; Plasencia Camps; Reimers*; Rigo; Sashida*; Savage; Sudar; Takahashi; Wardlaw; Yoshida

Biostratigraphy Agematsu*; Albanesi; Aldridge; Artyushkova; Bagnoli; Bader; Bardashev; Bardasheva; Barrick; Bauer; Berkyova*; Bikbaev*; Blanco-Ferrera*; Bultynck; Corradini; Corriga; Day*; Dong; Ethington; Ferretti; Garcia-López; Gatovsky; Gholamalian; Golding; Goudemand; Gouwy*; Hall; Heckel; Henderson; Herbig; Ishida; Izokh; Jeppsson; Johnston; Kaiser; Katvala*; Kirchgasser; Kirilishina*; Klapper; Kleffner; Kolar-Jurkovšek; Kononova*; Kozur; Leatham; Lehnert*; Leslie; Liao*; Liu*; Löfgren; Luppold; Männik; Mastandrea; Matyja; McCracken; McHargue*; MacKenzie*; Maslov*; Méndez; Metcalfe*; Mikami; Miller (J.F.); Murphy*; Narkiewicz; Navas-Parejo; Nicora; Norby; Nowlan; Obut; Orchard; Over; Park; Percival; Perri; Piecha; Plasencia Camps; Poole; Randon; Repetski; Rexroad; Rigo; Rosscoe*; Ruppel*; Sarmiento; Sashida*; Savage; Scomazzon; Sevastopulo; Shen; Simpson; Snigireva*; Spalletta; Sudar; Sweet; Takahashi; Tarabukin*; Viira; Whiteside*; Witzke*; Woroncowa-Marcinowska; Wu (Rongchang)*; Yao; Zhang (Shunxin); Zhen
Biochronology Orchard

Boundaries Izokh; Méndez; Obut
Zonation Bardashev; Bardasheva
Correlation Jeppsson
Graphic correlation Gouwy*; Sloan

Stratigraphy Alekseev; Bardashev; Bardasheva; Bender*; Boncheva; Groessens; Isozaki; Königshof; Männik; Nowlan; Poole; Pyle*; Rigo; Suttner; Tarabukin*
Sequence stratigraphy Johnston; Lambert*; Rosscoe*
Chronostratigraphy Kleffner; Lambert*; Rigo; Takahashi; Valenzuela-Ríos*; Whiteside*

Event stratigraphy Matyja
Events Jeppsson; Kleffner; Männik; Perri; Sandberg; Simpson; Spalletta; Talent
Mass Extinction Isozaki; Sandberg; Savage; Takahashi; Talent
Crises Girard
Oceanic episodes Kleffner

Evolution Aldridge; Barnes; Donoghue; Gedik*; Männik; Purnell; Zhuravlev
Macro- and microevolutionary patterns and processes Jones (David)*

Phylogeny Donoghue; Gatovsky; Kirilishina*; Kononova*; Purnell; Sandberg; Sanz-López
Phylomorphogeny Bardashev; Bardasheva
Statistical analysis Medina-Varea***;*** Purnell
Morphometrics Girard; Goudemand; Manship; Purnell
Shape analysis Goudemand; Purnell; Sloan

Morphogenesis Goudemand
Morphology Zhuravlev

Ontogeny Goudemand; Kiliç*; Zhuravlev
Histology Dong; Goudemand; Nascimento*; Repetski; Zhang (Huaqiao); Zhuravlev
Ultrastructure Barnes; Donoghue; Repetski; Trotter*
Microwear Jones (David)*; Purnell
Functional morphology Jones (David)*; Nazarova*; Purnell; Sansom*
Function Donoghue; Tarabukin*; Zhuravlev
Function of apparatuses Bultynck
Palaeobiology Aldridge; Buryi*; Donoghue; Girard*; Henderson; Marquez Aliaga; Nicoll; Norby; Plasencia Camps; Purnell; Rexroad; Smith; Suttner; Szaniawski
Affinities Katvala*
Apparatus reconstruction Agematsu*; Ishida*;Norby; Scomazzon; Suttner; von Bitter
Multielements Metzger*

Systematic palaeontology Dong; Nemyrovska
Systematics Aldridge; Repetski
Taxonomy Albanesi; Barnes; Bauer; Berkyova*; Blanco-Ferrera*; Bultynck; Corradini; Corriga; Ethington; Gatovsky; Goudemand; Jeppsson; Johnston; Kaiser; Kirchgasser; Klapper; Kozur; Löfgren*; McCracken; Männik; Mawson; Medina-Varea*; Metzger*; Miller (C.G.); Narkiewicz; Perri; Pyle*; Repetski; Sandberg; Sanz-López; Sashida*; Sevastopulo; Simpson; Smith; Spalletta; Suttner; Valenzuela-Ríos*; Zhen
Databases Charpentier

Paleoecology Albanesi; Barnes; Bikbaev*; Bultynck; Charpentier; Gatovsky; Gholamalian; Goudemand; Henderson; Herbig; Johnston; Katvala*; Kirilishina*; Königshof; Kononova*; Kozur; Lai; Leatham; Leslie; McCracken; Männik; Marquez Aliaga; Matyja; Mawson; Medina-Varea*; Méndez; Narkiewicz; Nowlan; Over; Paull*; Percival; Perri; Purnell; Rigo; Rosscoe*; Sandberg; Sansom; Sanz-López; Scomazzon; Snigireva*; Spalletta; Tarabukin*; Trotter*; Wheeley; Zhang (Shunxin); Zhuravlev
Biofacies Bikbaev***;*** Dumoulin; Gholamalian; Kaiser; Leslie; Narkiewicz; Navas-Parejo; Piecha; Poole; Sandberg; Snigireva*; Tarabukin*
Palaeoclimatology Day*; Trotter*

Biogeographic affinities Boncheva

Biogeography Goudemand; Metcalfe*; Orchard; Poole; Talent; Zhen; Zhuravlev
Palaeogeography Bultynck; Dumoulin; Hirsch*; Ishida; Katvala*; Kozur; Männik; Navas-Parejo; Nowlan; Valenzuela-Ríos*
Palaeobiogeography Albanesi; Agematsu*; Bagnoli; Lambert*; Medina-Varea*; Plasencia Camps; Percival; Repetski; Sandberg; Scomazzon; Shen

Biogeochemistry Leslie; Takahashi; Trotter*
Geochemistry Belka; Dopieralska; Rigo
Isotope geochemistry Barnes; Lehnert*; Talent
Stable isotopes Alekseev; Berkyova*; Day*; Purnell; Ruppel*; Takahashi; Wheeley
Carbon isotopes Kaiser
Strontium isotopes Purnell; Rigo; Ruppel*
Sr and Nd isotopes Scomazzon
Paleoseawater Belka; Dopieralska
Laser ablation Nascimento*

CAI Albanesi; Barnes; Belka; Blanco-Ferrera*; Boncheva; Garcia-López; Gatovsky; Ishida; Königshof; Kovacs*; Kozur; Lang; Lehnert*; Mastandrea; Metcalfe*; Narkiewicz; Navas-Parejo; Nicoll; Nicora; Norby; Nowlan; Paull*; Piecha; Pondrelli; Qi; Repetski; Sanz-López; Sarmiento; Sevastopulo; Tarabukin*; Zhang (Shunxin); Zhuravlev
Low-grade metamorphism Boncheva
Hydrocarbon exploration Boncheva
Relationship between CAI and quartz recrystallization Mikami

Bedding plane assemblages Aldridge; Leslie; Norby; Purnell

Taphonomy Purnell
Conodont Lagerstätten Purnell

Lithology Bikbaev*; Snigireva*
Lithofacies Dumoulin
Carbonates Berkyova*; Ruppel*
Black shales Ruppel*
Biosedimentation Liao*
Facial transitions and changes Boncheva
Sedimentology Boncheva
Conodonts in impact structures Miller (J.F.)

Research Activities, Personal and Other Items of Interest

Asterisk: no report for 2010, information from the Newsletter 2009*

Agematsu, Sachiko.* Ordovician to Devonian conodonts from Thailand and Malaysia; Triassic conodonts from Japan.
Albanesi, Guillermo. Studies on Lower Palaeozoic conodont faunas from west and northwest Argentine basins are continued. A new research project on conodont palaeothermometry from the Ordovician System of northwestern basins of Argentina will be developed during the next three years. Two PhD students, F. Zeballo and G. Voldman, will defend their theses in 2010. Colleagues from universities of Argentina and other countries are participating in joint projects on diverse topics of historical geology from the Lower Palaeozoic of South America, including conodont biostratigraphy, sequence stratigraphy, events, and paleothermometry.
The working group, in collaboration with colleagues of other Argentine institutions, will organize the next International Conodont Symposium (ICOS), to be held in Argentina, July 2013.
The "2º Symposium on Biostratigraphy and Events of the Lower Paleozoic" will be held within the frame of the "X Argentinean Congress of Paleontology and Biostratigraphy" to be carried out in La Plata City, between the 20th and 24th of September, 2010. http://www.congresospaleo2010.fcnym.unlp.edu.ar
Conveners: Guillermo Albanesi and Gladys Ortega.
Contacts: galbanes@com.uncor.edu, gcortega@arnet.com.ar
Aldridge, Dick. Ordovician conodont apparatuses from the Soom Shale, South Africa (continuing, in prep.); Silurian conodonts from South China (with Wang Cheng-yuan, to be published in 2010 as a Special

Paper in Palaeontology); cladistic study of *Hindeodus/Isarcicella* across the Permian-Triassic boundary (with Jiang Haishui and others, in prep.); cladistic study of Silurian *Ozarkodina* (in prep.)
Alekseev, Alexander. Ordovician conodonts from xenoliths in Devonian kimberlite pipes of the Arkhangelsk Region (with T. Tolmacheva); Carboniferous and Permian conodonts of the Russian Platform and S. Urals; upper Visean and Serpukhovian conodonts from the Moscovian Basin (with N.V. Goreva); Upper Carboniferous conodonts from Iran (with A. Reimers and N. Rasskazova); O isotopes in Carboniferous conodonts from the Russian Platform and S. Urals (with M. Joachimski).
Armstrong, Howard.* Industry sponsored projects on peri-glacial black shale deposition and high latitude responses to the Hirnantian glaciation; palaeobiogeographical study of graptolites and chitinoza (with T. Vandenbrucke and M. Williams) has commenced. The latter project is providing an amazing insight into shifting climate belts during the Upper Ordovician, and supplements work on Ordovician Intertropical Convergence Zone behaviour during cooling.
Artyushkova, Olga. Detailed investigation of Frasnian–Famennian interval in full different facial successions. Personal item of interest: In October 2009 – defence of doctoral thesis.
Bader, Jeremy D. Currently researching Pennsylvanian biostratigraphy in the Midcontinent, North Texas and Appalachian Basins.
Bagnoli, Gabriella. Cambrian and Ordovician conodonts from North China, South China, and Sweden.
Bancroft, Alyssa.* Silurian conodonts of SW Ontario, plus Ordovician conodonts in Pennsylvania, including Nd isotope analysis.
Bardashev, Igor. Silurian and Devonian stratigraphy and conodonts from Central Asia.
Bardasheva, Nina. Carboniferous stratigraphy and conodonts from Central Asia.
Barnes, Chris. Work with Shunxin Zhang (Geological Survey of Canada) continues relating conodont biostratigraphy, biofacies and biogeography to the pattern of eustasy and tectonism that affected northern Laurentia in the early Palaeozoic; currently on Late Ordovician condonts from southern Ontario (with Glen Tarrant). The geochemistry of conodonts is being pursued further in collaboration with Julie Trotter (Australian National University and CSIRO); currently on oxygen isotopes to determine paleotemperatures of Early Paleozoic seawater.
Barrick, James. Work continues on Wenlock-Pridoli (Silurian) conodont faunas and stable isotope chemostratigraphy, southern Laurentia, with M. Kleffner. Research on Pennsylvanian conodont faunas from New Mexico with S. Lucas and K. Krainer expands, as more sections from different ranges across the state have been sampled.
Barskov, Igor.* Conodonts of the Serpuchovian type section, Russian Platform.
Bauer, Jeff. Description of conodonts from the Pruitt Ranch Member (Simpson Group, south-central Oklahoma) and subsurface samples from the Arkoma Basin
Belka, Zdzislaw. Study on Late Devonian conodont stratigraphy in the eastern Anti-Atlas, Morocco. Other projects include studies on REE isotope chemistry of conodont elements in the Variscan Europe and CAI studies in the Devonian of northern Africa and Iran. New project focuses on variations in conodont element composition.
Bender, Peter. * Devonian and Carboniferous conodonts of the Rheinische Schiefergebirge (Lahn-Dill area).
Bergström, Stig. Projects on Ordovician and Silurian conodonts in Baltoscandia, China, North America, and Argentina
Berkyova, Stana.* The Basal Choteč event and contemporaneous environmental and biotic changes; late Emsian-early Eifelian conodont taxonomy in Nevada and the Prague Basin (with G. Klapper & M. Murphy).
Bikbaev, Alexander.* Upper Devonian of the Urals, especially Frasnian/Famennian boundary.
Blanco Ferrera, Silvia.* CAI and textural alteration in conodonts related to hydrothermal activity; conodonts from diagenesis to metamorphism in the N. Iberian Peninsula, focused in NW Cantabrian Mtns; Mississippian *Gnathodus* species systematics; the Visean-Serpukhovian boundary; conodont faunas near the Mid-Carboniferous boundary; Myachkovian to Kasimovian conodonts from the Cantabrian Mtns.
Boncheva, Iliana. Paleontological and stratigraphical investigations of the Silurian, Devonian and Carboniferous in southeastern Bulgaria and northwestern Turkey based on conodonts.
Brown, Lewis. In progress (with Carl B. Rexroad): Conodont biostratigraphy of the Porvenir Formation, New Mexico; Alum Cave Member of the Dugger Formation, southeastern Illinois Basin.
Bultynck, Pierre. Study of diversity and variability of upper Eifelian and lower Givetian conodont taxa, mainly based on the conodont material from the GSSP for the base of the Givetian (Jebel Mech Irdane, Tafilalt, S Morocco) and comparison with published conodont faunas from the same stratigraphic interval in other relevant sections.
Buryi, Galina.* Main or key morphological structures of euconodont animals.
Carey, Stephen. Nothing to report.
Castello, Veronica.* Devonian conodonts especially tied to the Frasnian-Fammenian boundary and stages.

Charpentier, Ronald. Not currently active.
Corradini, Carlo. Devonian/Carboniferous boundary. Evolution of early siphonodellids. Conodont biozonation in the Silurian and Lower Devonian. Silurian, Devonian and Lower Carboniferous conodonts from Sardinia. Silurian to Lower Devonian conodonts from the *Orthoceras* limestones of the Carnic Alps. Lithostratigraphy of the pre-Variscan sequence of the Carnic Alps
Corriga, Maria Giovanna. Silurian/Devonian boundary. Silurian to Lower Devonian conodonts from Sardinia, Carnic Alps and Spain.
Day, Jed.* Middle–Late Devonian conodont and brachiopod biostratigraphy of continental margin, reef platform and basinal facies in W. Canada (see Whalen & Day, 2008); Givetian and Frasnian conodont biostratigraphy of the epeiric carbonate ramp system in the Iowa Basin (Witzke *et al.*); conodont apatite-based sea surface records for the Frasnian–early Famennian of the equatorial ocean from Alberta (B.C.), compared with the coeval record from the Iowa Basin to study the role of climate change and third order sea level changes and climate, as a driver for Kellwasser extinction bioevents; the Famennian in subsurface of the Iowa and Illinois basins (with J. Over, underway); C isotope chemostratigraphy of the upper and uppermost Famennian D–C boundary interval in the E. Missouri (with Rowe & Rimmer) with new more complete records of late Famennian carbon isotope events-excursions (Cramer *et al*., in press). High-resolution integrated C isotope and magnetic susceptibility on the uppermost Famennian Substage in core H-32 (near completion); short term Milankovitch precession and obliquity signals are resolvable, and will permit astronomical calibration (4.1 million year duration) of the M. *expansa* to U. *praesulcata* zone interval, and constraining the onset of the Late Devonian greenhouse-icehouse climate transition.
Dong, Xiping. Cambrian through Lower Ordovician conodonts from Hunan, S. China , and Liaoning, Shandong, N. China; histology of protoconodonts , paraconodonts and earliest euconodonts from China.
Donoghue, Philip. The origin of conodonts, conodont functional morphology and element structure.
Dopieralska, Jolanta. Studies on REE isotope composition of Devonian and Carboniferous conodonts in the Variscan realm
Dumoulin, Julie. Research in 2009 focused on the Carboniferous–Permian Lisburne Group throughout northern Alaska (particularly the phosphorite and organic-rich shale in this unit) and on Palaeozoic (meta)carbonate rocks in the Brooks Range and on Seward Peninsula
Dusar, Michiel. Devonian – Carboniferous stratigraphy in northern Belgium. Geoheritage values including Paleozoic stratigraphy in Dong Van Karst Plateau geopark, Vietnam.
Dzik, Jerzy. Ordovician and Devonian conodonts; platform-bearing conodonts from the Mid Ordovician of southern Siberia.
Ethington, Raymond. Upper Ibexian–Lower Whiterockian faunas of western Utah. Faunas of Blue Earth Siltstone and Oneota Formation, upper Mississipi Valley region
Ferretti, Annalisa. Late Ordovician conodont biostratigraphy in southern Europe.
Furey-Greig, Terry. Acid-leaching by Masaki Umeda of the chert-rich Woolomin Formation in quest of radiolarians has produced a diverse fauna of Early Devonian (Emsian) conodonts from outcrops along Dungowan Creek (between Nundle and Tamworth, NSW); these are being documented in a joint paper with Masaki and Ruth Mawson.
García-López, Susana. Conodonts from the Silurian to Lower Carboniferous, mainly focusing on biostratigraphy and biofacies topics. Projects dealing with CAI research in the Cantabrian Zone (NW Spain).
Gatovsky, Yury A. Upper Devonian and Lower Carboniferous conodonts from the East Russian Platform, southern and western Kazakhstan, Urals and southern Timan.
Gholamalian, Hossein. Biostratigraphy of Late Devonian of Central Iran in addition to the Givetian–Frasnian boundary.
Girard, Catherine.* Frasnian–Famennian conodonts from the Montagne Noire; size and shape analysis of conodonts (especially *Palmatolepis*) (with Renaud, Lyon, France); oxygen isotopes from conodont apatite (with M. Joachimski, Germany) and Sr/Ca ratios of conodonts (with V. Balter, Lyon, France).
Golding, Martyn. Lower Triassic conodont biostratigraphy of northeastern British Columbia. Personal items of interest: First year of PhD at the University of British Columbia
Goudemand, Nicolas. Still working on Early Triassic conodonts. Developed a new functional model for ramiform elements. Personal items of interest: PhD will end up soon this year. Now actively looking for a post-doc position.
Gouwy, Sofie.* Lower and Middle Devonian of Sardinia, Middle Devonian of the Spanish Central Pyrenees (with J.I. Valenzuela Rios & J.C. Liao).
Groessens, Eric. No more activities in relation with conodonts. Personal items of interest: Retired since 1st of June 2009, but still active especially in the field of history of Geology.
Hairapetian, Vachik.* Silurian Niur Fm. in Derenjal Mtns., east-central Iran (with G. Miller). Numerous conodonts and ostracods have been collected. A paper on fish (thelodonts and a few acanthodians) was recently published.

Hall, Jack. Slow progress on Middle Ordovician biostratigraphy of Central Appalachians. Personal items of interest: Still Chair of the Department of Environmental Studies. Most of my time is now administrative adventures but try to find a little time for research.

Heckel, Phil. Biostratigraphic studies of Pennsylvanian conodonts continue with colleagues, especially in terms of providing stratigraphic information for conodont occurrences, and resolving correlation problems of marine units and cyclothems; currently working on lower Conemaugh units in Northern Appalachian Basin.

Henderson, Charles. Sequence biostratigraphic research on Upper Palaeozoic to Triassic strata around the world including Western and Arctic Canada, Bolivia, China, Oman, Russia and the United States. Research focuses on the development of refined biozonations by investigating evolutionary models for conodont speciation, the extent of conodont provincialism, and the recognition of geographic clines. As Chairman of the Subcommission on Permian Stratigraphy the work is devoted on completing GSSP definitions for the Permian System. The SPS website at http://www.nigpas.ac.cn/permian/web/index.asp will be of interest to Permian Researchers. Most of the graduate students in the Centre for Applied Basin Studies (www.ucalgary.ca/conodont/cabs) are conducting sequence biostratigraphic and petroleum geology studies in the subsurface of Alberta and northeastern British Columbia on uppermost Devonian to Triassic rocks. In July 2009 I hosted ICOS 2009 at the University of Calgary. The abstract volume and field excursion guidebook are available at http://www.ucalgary.ca/conodont/icos

Herbig, Hans-Georg. No new activities.

Hirsch, Francis.* Gondolellacean multi-elements and paleobiogeography (with K. Ishida, Tokushima and A. Murat Kilic, Balikesir).

Hisayoshi, Igo. Biostratigraphy of Triassic and Upper Palaeozoic.

Ishida, Keisuke. Work is focused on Carboniferous and Triassic materials from SW Japan with reference to their faunal affinity and depositional environment of carbonates that accreted in SW Japan. A paper draft co-authored with Francis Hirsch for the Triassic Gondolellids and Gladigondolellids apparatus of the Nogami (1968) collection from Timor has been submitted. Faunal analysis across the Carnian–Norian boundary in pelagic siliceous facies collaborating with Teiji Mikami is continuing for the correlation between the Inner and Outer zones in SW Japan.

Isozaki, Yukio. Continuing studies on the Permo–Triassic boundary and Guadalupian–Lopingian boundary mass extinction in Japan, China, and Croatia.

Izokh, Nadezhda. Active study on conodonts from Ordovician, Silurian and Devonian of the Altai-Sayan Folded Area, West Siberia, Russia and South Tien.

Jeppsson, Lennart. Silurian conodonts, high resolution biostratigraphy and correlations, Silurian conodont taxonomy, event effects, etc. Personal items of interest: Nothing to report, I was forced to retire some years ago and I was awarded the Society's medal; nothing new.

Jiang, Haishui. Conodont across the P–T boundary from south China.

Johnston, David. Biostratigraphy of Late Devonian to Early Mississippian conodonts from the surface and subsurface of southern Alberta and southeastern British Columbia, Canada (presented at ICOS09 meeting; see abstracts). Co-leader and author of guidebook for post-meeting field trip to Rocky Mountains (see publications). A manuscript (with Charles Henderson and Michael Schmidt) on Late Devonian to Early Mississippian conodonts from the surface and subsurface of southern Alberta and southeastern British Columbia, Canada was submitted. Personal item of interest: Continuing to do conodont and non-conodont related consulting for Canadian petroleum industry.

Jones, David.* Using microwear to elucidate conodont ecology; constraining palaeothermometry based on conodont oxygen isotopes.

Kaiser, Sandra. Conodont taxonomy and biostratigraphy in the Upper Famennium and Lower Tournaisium in the Circum–mediterranean Area and Germany, and in the Middle Triassic of SW Germany. Activities within the D–C boundary Working Group which was established for the redefinition of the D–C boundary. Reconstruction of palaeoenvironmental changes in Morocco and Europe by using stable isotope geochemistry and sedimentology.

Katvala, Eric Cowing.* Using biostratigraphic, palaeoecologic, and palaeogeographic data from Mississippian-Triassic conodonts to constrain palaeontologic, stratigraphic, and tectonic interpretations in the accreted terranes of western North America; element distributions in conodont elements utilizing the electron microprobe.

Kiliç, Ali Murat.* Multielement taxonomy of Triassic conodonts (with F. Hirsch).

Kirchgasser, William. Nothing to report.

Kirilishina, Elena.* Frasnian and Famennian conodonts of the central Russian Platform.

Klapper, Gilbert. Research continues on Emsian through Famennian conodont taxonomy and biostratigraphy. Papers are in progress with Bill Kirchgasser on the Frasnian of New York State, and with Stana Berkyová and Michael A. Murphy on late Emsian – early Eifelian taxonomy in Nevada and the Prague Basin.

Kleffner, Mark. Presently actively involved in six projects: (1) a revised conodont-, graptolite-, and chitinozoa-based Silurian chronostratigraphy (with James Barrick); (2) $\delta^{13}C$ chemostratigraphy of Ordovician–Silurian boundary strata of the North American Midcontinent (with Stig Bergström); (3) conodont biostratigraphy, oceanic episodes, and $\delta^{13}C$ chemostratigraphy of Silurian–Devonian boundary strata in New York; (4) Ireviken Event and Ireviken $\delta^{13}C$ excursion (with Brad Cramer and many others); (5) oceanic episodes, ^{13}C chemostratigraphy, and updated Homerian, Gorstian, and Ludfordian (Silurian) conodont biostratigraphy of southern Laurentia; and (6) Silurian high-resolution stratigraphy on the Cincinnati Arch (with Brad Cramer, Pat McLaughlin, and Carlton Brett).
Kolar-Jurkovšek, Tea. Studies on P–T interval and Triassic in order to establish conodont biozonation of Dinarides.
Königshof, Peter. In the last year the focus of research concerned palaeenvironmental studies including biostratigraphy in various regions, such as Morocco, Germany and Turkey. Research on conodont alteration have been continued.
Kononova, Ludmila.* Middle to Late Devonian and Early Carboniferous conodonts.
Kozur, Heinz. Permian and Triassic conodont taxonomy, biostratigraphy and palaeogeography.
Lai, Xulong. Conodonts around the Permian–Triassic Boundary and Guadalupian–Lopingian Boundary in South China. Personal items of interest: Since the beginning of 2009, I have been appointed as the Dean of Faculty of Earth Sciences, China University of Geosciences (Wuhan).
Lambert, Lance.* Carboniferous and Permian (including Moscovian) chronostratigraphic boundaries (with task groups), and Middle Permian (with colleagues).
Lang, Jiabin. The Late Carboniferous conodonts in the south of Liaoning Province, China.
Lehnert, Oliver.* O isotopes from conodont phosphate for Cambrian–Silurian palaeoclimate reconstructions from different palaeocontinents and palaeolatitudes; facies development, sea-level changes and stable isotope stratigraphy of the Baltic area, Prague Basin and other areas.
Leatham, Britt. Biostratigraphic and palaeoecologic study of basal transgressive Kaskaskia sequence sandy carbonates near Death Valley, California. Trying hard to figure out icriodids. Also documenting early Triassic fused clusters west of Death Valley, California.
Leslie, Stephen. Work is focused on integrating Ordovician conodont biostratigraphy with graptolite biostratigraphy, event stratigraphy, and chemostratigrphy. In particular work includes study on dark shale sequences and conodonts on bedding planes, looking for and finding natural assemblages that should help resolve ideas regarding the position of elements in the apparatus and the function of elements. Another important topic is examining isotope changes throughout the Ordovician in C, Sr, Nd, and O systems. A goal of this work is to examine changes that occur within theses systems and relate them to tectonic, climatic, and oceanic changes that occurred prior to and during the transition from and greenhouse to icehouse world during the Middle and Late Ordovician.
Liao, Jau-Chyn (Teresa).* Conodont biostratigraphy and biosedimentation of neritic and pelagic facies in the Spanish Central Pyrenees; correlation with other sequences, mainly in the Iberian Chains and Rhenish Slate Mtns.
Liu, Jianbo.* Lower Triassic conodonts (with S. Yang) and Ordovician conodonts (with Y.-y. Zhen).
Löfgren, Anita. Continuing research on Early and Middle Ordovician conodonts, with several colleagues abroad.
Luppold, Friedrich. The type locality of the Kellwasser-Kalk was extended in November 2009 together with some colleagues. This year the activities are going on to describe the new outcrop situation, sampling etc.. Other conodont activities which started some months ago let rest for indefinitely time.
Männik, Peep. Evolution, taxonomy and palaeoecology of Ordovician and Silurian conodonts; Ordovician–Silurian boundary in Baltic and in the Timan-Pechora region; evolution and high-resolution stratigraphy of the Early Palaeozoic sedimentary basins on Baltica and Siberia palaeocontinents (with colleagues from Estonia, Germany, Russia, Sweden, U.K. and USA).
Manship, Lori. Nothing to report.
Marquez Aliaga, Ana. Iberian (western Tethys) Triassic palaeobiology and biostratigraphy
Martinez-Perez, Carlos.* Emsian conodonts from Spain.
Maslov, Viktor.* Devonian conodont biostratigraphy, especially from the S. Urals.
Mason, Charles.* Conodonts from the Haughton impact crater, Canadian High Arctic; 2007 and 2008 field samples finally arrived (ongoing, with J. Repetski).
Mastandrea, Adelaide. Carnian–Rhaetian conodont biostratigraphy of the Northern Calabria and Basilicata (Southern Italy) and CAI.
Mathieson, David. Continues dabbling with the Early Devonian conodonts and other biota from outcrops and bores scattered across the western half of New South Wales; a monograph (with Ruth Mawson et al.) covering the conodont biostratigraphy of the entire region is close to submission.

Matyja, Hanna. Devonian to Mississippian stratigraphy and sedimentology, including D–C boundary. Integrated analysis of Famennian conodonts and miospores (MS in preparation with A. Tomas); integrated analysis of Middle Devonian miospores and conodonts (MS in preparation with E. Turnau).

Mawson, Ruth. Is well advanced in dealing with conodonts (mainly latest Frasnian–Famennian) from sequences of the Hongguleleng Formation (or Group) of northwest Xinjiang (China) amassed during fieldwork in association with Chen Xiuqin (Nanjing Institute of Geology and Palaeontology) and others. Some progress has been made with the Devonian conodont faunas of the Yarrol Terrane of east-central Queensland, especially in the Monto Biloela, Ambrose Bajool and Mount Etna areas. The majority of the conodonts have come from limestone olistoliths— some of kilometric-scale though with internally coherent stratigraphy, e.g. at Mt Etna. Most of the sedimentary units of the Yarrol Terrane are demonstrably allochthonous. Extraction of conodonts from stratigraphic sections through the Ordovician limestones of the Carriers Well and Fork Lagoon formations, respectively from the Broken River and Anakie regions was completed a few years ago; the conodonts are abundant and diverse in both formations and will form the basis of a monograph involving Andrew Simpson and Yong-yi Zhen. A monograph on the Early Devonian conodonts of the western half of New South Wales (with David Mathieson and others) is close to submission.

McCracken, Sandy. After a term on management, attempting to get back to work on Middle to Upper Ordovician, Silurian and Devonian and conodonts from various locations in Canada.

Meço, Selam. Silurian, Devonian, Triassic conodonts.

Medina-Varea, Paula.* Mississippian conodonts of Sierra Morena (SW Spain) and Morocco; gnathodid taxonomy and biostratigraphy, Mississippian, Atlantic Canada (ongoing, with P. von Bitter).

Méndez, Carlos. Carboniferous (Pennsylvanian) conodonts from the Cantabrian Mtns. (N. Spain) with special interest in Bashkirian–Moscovian and Moscovian–Kasimovian boundaries

Merrill, Glen. Continues work on *Gondolella* with Peter von Bitter and on the Pennsylvanian faunas in SE Ohio.

Metcalfe, Ian.* Conodont CAIs in N. England; Permian–Triassic and P–T boundary conodont biostratigraphy in China, SE Asia and W. Australia.

Metzger, Ronald.* Multielement taxonomy of conodonts from the Devonian State Quarry Limestone nr. Iowa City, Iowa (ongoing).

Mikami, Teiji. Late Triassic biostratigraphy and palaeobiogeography on the ocean in Japan.

Miller, Giles. Images of Hinde's Conodont Collection of 1879 have been posted on the NHM specimen catalogue web site. http://web-qa.nhm.ac.uk/research-curation/collections/departmental-collections/palaeontology-collections/search/ Details of specimens from Rhodes, Austin and Druce (1969) and Aldridge (1972) also now appear on-line. Specimens from the Silurian of Iran and the Ordovician of Oman have reached the top of the priority pile and will be written up this year.

Miller, James. 1. Conodonts from a mid-Mississippian impact structure in Missouri (with Ray Ethington and Tom Thompson. 2. Middle Ordovician conodonts from the Sauk–Tippecanoe Sequence boundary in Utah (with Ray Ethington). 3. Clarification of age of oldest *Cordylodus* (with John Repetski).

Molloy, Peter. He and Andrew Simpson have produced a manuscript on the response of conodonts to the sub-events of the Ireviken Event (earliest Wenlock) as represented in the Boree Creek sequence of New South Wales; the faunas are voluminous, diverse and elegant. The paper is in press in the International Year of Planet Earth volume: *Earth and Life: Global Biodiversity, Extinction Intervals and Biogeographic Perturbations through Time.* Thin carbonates in the basal part of the essentially volcaniclastic Vanneck Formation (approximately Givetian–Frasnian boundary) of the Townsville Hinterland are being exhaustively probed for conodonts. Previously regarded as non-marine, the Vanneck Fm has produced strophalosiid brachiopods.

Murphy, Michael.* Middle Devonian of central Nevada conodonts (with S. Berkyova); integrating Lower Devonian ostracod and conodont biostratigraphies of Nevada (with C. Dojen); Barrandian across the S–D boundary (with P. Carls); isotope studies through the Middle Devonian, particularly measuring isotopes across the S–D boundary at Birch Creek (with M. Elrich); graptolite studies across the S–D boundary (with K. Springer); Emsian study in the Sulphur Springs Range, with brachiopods, fish and conodonts present (with A. Pedder); exciting Cretaceous projects with methane seeps and Albian correlation.

Nakrem, Hans Arne. Still some Permian conodont work to be finished.

Narkiewicz, Katarzyna. The upper Givetian (Middle Devonian) *subterminus* Zone in North America, Europe and North Africa with Pierre Bultynck – submitted by the end of 2009; Middle Devonian conodonts from Belarus: biostratigraphy and palaeoecological aspects with Semen Kruchek; Tetrapod trackways from the Eifelian of Poland (with Grzegorz Niedźwiedzki et al. 2010) by constraining the age of the associated conodont fauna *Bipennatus bipennatus montensis* (Weddige, 1977). The description of the fauna will be separately published by K. Narkiewicz and M. Narkiewicz (in print); Spore biohorizons and associated conodont faunas within Givetian and ?Frasnian from SE Poland with E. Turnau - submitted by the end of

2009; Preparation on the monography of the Devonian Radom-Lublin basin, SE Poland (with M. Narkiewicz and E. Turnau).
Nascimento, Sara.* Conodont biostratigraphy of the lr. Itaituba Formation (Atokan, Pennsylvanian) of the Amazonas Basin, Brazil.
Navas-Parejo, Pilar. Palaeozoic stratigraphy and conodont biostratigraphy of the Maláguide Complex (Betic Cordillera, SE Spain), and related Mediterranean domains.
Nazarova, Valentina.* Middle–Upper Devonian and Carboniferous conodonts of the Russian Platform (ongoing); conodont functional morphology.
Nemyrovska, Tamara. Continues to work on the Carboniferous conodonts of the Donets Basin (Ukraine) and the Cantabrian Mountains (Palencia, Spain). She continues her duties as a member of the Visean-Serpukhovian, Bashkirian-Moscovian, Moscovian-Kasimovian and Kasimovian-Gzhelian Task Groups. The manuscripts on the Swadelina genus (late Moscovian) conodonts of the Donets Basin and the Mid-Carboniferous conodonts of the Cantabrian Mountains will be submitted very soon.
Nicoll, Robert. Examination of Permian and Triassic conodont faunas of Western Australia, Early Ordovician conodonts from northern Australia.
Nicora, Alda. Conodonts from the: Carboniferous–Permian successions of the Alborz Mountains (Iran); Permian sequence of Tunisia, Oman, Turkey, Pakistan; Middle Triassic of Central Iran (Nacklak area); Upper Triassic of Sicily (Italy).
Norby, Rodney. *Lochriea* apparatus (with P. von Bitter); Silurian biostratigraphy of Illinois and Wisconsin (with D. Mikulic); regional CAI database (with J. Repetski *et al.).*
Nowlan, Godfrey. Limited activity in conodonts at the moment. Our lab receives samples, particularly from Arctic Canada at the moment because of new GSC funding. Reports completely recently on Ordovician–Silurian of Manitoba, Ordovician of western Newfoundland.
Obut, Olga. Ordovician conodont biostratigraphy.
Orchard, Michael. Carnian–Norian Boundary: new taxonomy & biozonation. Middle Triassic *Neogondolella*. Triassic GSSPs. Triassic multielements. Late Palaeozoic of Cordilleran terranes.
Over, Jeffrey. 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.
Owen, Susan. Personal items of interest: Still living in North Dakota, USA. Retired from USDA Forest Service as of 31 December 2009.
Park, Soo-in. Interest in Mid-Carboniferous and Permian conodonts
Percival, Ian. Continued work on documenting Early and Middle Ordovician conodonts occurring in cherts of the Lachlan Orogen in central New South Wales. Collaboration with Yong-yi Zhen (Australian Museum, Sydney) resulted in two papers on Ordovician conodonts from South China appearing in *Alcheringa*. Another two papers with Dr Zhen as senior author (one on Darriwilian (Middle Ordovician) conodonts from New Zealand, the other reviewing the new family Serratognathidae) were published at the end of 2009 in the *Association of Australasian Palaeontologists Memoir* on Cambro-Ordovician Studies Volume 3. Worked with Wu Rongchang and Zhan Renbin (Nanjing Institute of Geology & Palaeontology) on study of Ordovician biodiversification of conodonts in the Zitai Formation of Anhui Province, China (published in *Alcheringa* in March 2010).
Perret-Mirouse, Marie France. After retiring, is concluding some work in collaboration with colleagues. Her material will be left to Silvia Blanco and Javier Sanz.
Perri, Maria Cristina. Devonian–Early Carboniferous conodonts from the Carnic Alps (Southern Alps); Late Permian–Triassic conodonts from the Southern Alps; Events across the Frasnian–Famennian, Devonian–Carboniferous and Permian–Triassic boundaries. A paper
Pickett, John. No new activities.

Piecha, Matthias. Biostratigraphy of Devonian and Carboniferous conodonts from the Rhenish Massif.
Pieracacos, Nick. No activity to report.
Plasencia Camps, Pablo. Currently working on some papers about *Pseudofurnishius*, and in Iberian (western Tethys) Triassic paleobiology and biostratigraphy.
Pondrelli, Monica. Sampling for Pragian to Famennian conodonts in the framework of a project focused to formalize the lithostratigraphic units of the Carnic Alps.
Poole, Forrest (Barney). Utilizing Paleozoic conodont biofacies and zonation in dating strata for local mapping and regional correlation in Sonora and Sinaloa, Mexico, and Nevada and Utah in the southwestern United States. Compiling conodont data for two central Nevada maps being prepared for peer review later this year. Conodont zonation and ages are being utilized in determining depositional and structural settings of Palaeozoic strata in the two map areas. Personal items of interest: Completing USGS legacy projects in northwest Mexico and southwest U.S. since retirement in 1995.
Purnell, Mark. Decay and preservation of chordate soft-tissues, and the implications for understanding fossils (including conodonts with soft-tissue remains). Quantitative micro- and mesowear analysis of conodont teeth, testing hypotheses of element/apparatus function. 3D analysis of element morphology and complexity.
Pyle, Leanne.* Cambrian to Devonian stratigraphy in the northern Mackenzie Mtns, Franklin Mtns, and Peel Plateau and Plain (Northwest Territories).
Qi, Yuping. Cooperate with James Barrick and Lance Lambert to study the Pennsylvanian conodonts from the South China and North America. Cooperate with Gabriella Bagnoli to study the Cambrian conodonts from the South and North China. Personal items of interest: Doctor Degree, 2008; Professor, 2009.
Randon, Carine. Still working on Devonian and Carboniferous conodonts.
Reimers, Aleksey.* Carboniferous and Permian conodonts of Iran; Ordovician, Permian and Triassic conodonts from the Russian Platform, Urals and E. Siberia (ongoing).
Repetski, John. Cambrian and Ordovician conodont biostratigraphy, USA and elsewhere; CAI and systematics; CAI maps of eastern U.S. basins; biostratigraphic support for USGS and other mapping projects, mostly Cambrian to Carboniferous; also age-dating of faunas and studies of Cambrian and Ordovician phosphatic problematica.
Rexroad, Carl. Upper Mississippian in West Virginia (with M. Blake and J. Beuthin), in Illinois (with J. Devera), and in Indiana; Pennsylvanian Porvenir Formation in New Mexico (with Lew Brown), in the Midwest on the Alum Cave limestone and Bucktown coal with Lew Brown and on the Lead Creek limestone. Personal items of interest: I particularly enjoyed ICOS 2009 in Calgary, Alberta, Canada, for which Charles M. Henderson had primary responsibility for organizing and running.
Rigo, Manuel. Biostratigraphy and Sr and O isotope analyses of Triassic conodonts of the Lagonegro and Sicani basins (S Italy), and the Southern Alps.
Rosscoe, Steve.* Moscovian–Kasimovian (M. Upper Pennsylvanian) boundary interval in the Midcontinent Basin and in north-central Texas.
Ruppel, Stephen.* Barnett (Mississippian) black shales and related carbonates in Texas (with D. Boardman); Woodford (Devonian) black shales in New Mexico and Texas (with J. Over).
Salinas, Jose.* Pennsylvanian goniate nursery from East Mountain Shale in north-central Texas; palaeoecology of the Ames Limestone from Ohio (both projects involve conodonts; ongoing, with G. Merrill).
Sandberg, Charles. (1) With Jared Morrow, identifying sequence of Devonian Early *rhenana* to *linguiformis* Zone faunas from Burbank Hills, Utah. (2) With Jared, processing and identifying conodont samples from new Osagean unit on Antler forebulge, western Utah. (3) With Jared, deciphering Frasnian *punctata* Zone Alamo Impact-related uprush deposits, western Utah. (4) Updating D–C Conodont Database by adding new entries, revising old identifications, and trying to convert to cross-platform version. (5) With Gil Klapper, identifying new and problematic Devonian conodonts across Early–Middle Devonian boundary. (6) With F. G. (Barney) Poole, collecting and processing Ordovician to Permian conodont samples from chaotic terrane in southern Fish Creek Range, Nevada. (7) Processing and identifying Late Ordovician, Devonian, Mississippian, Pennsylvanian, and Early Permian conodont samples collected by Poole in Sonora and Sinaloa, Mexico.
Sanz-López, Javier. Continues work on CAI studies in the Cantabrian Mountains (with S. Garcia-Lopez and S. Blanco-Ferrera), in Mississippian conodonts, particularly *Gnathodus* species (with S. Blanco-Ferrera & M.-F. Perret), in the Visean–Serpukhovian, Bashkirian–Moscovian and Moscovian–Kasimovian conodont stratigraphic distribution in Cantabrian Mountains.
Sarmiento, Graciela. Ordovician and Silurian conodonts from several localities of Spain, Morocco and Turkey.
Sashida, Katsuo.* Ordovician conodonts (ongoing).

Savage, Norman. Work on the Late Frasnian to Late Famennian section at Mae Sariang is continuing during 2010, including a detailed lithologic log during early February, and additional whole-rock and conodont geochemical studies ongoing at the U. of Oregon.
Saydam-Demiray, Dilek Gulnur.* Early–Middle Devonian conodont biostratigraphy of the Istanbul region.
Scomazzon, Ana Karina. Supervising PhD student in biocronostratigraphy of Atokan conodonts of Amazonas Basin; Project in conodont apparatus skeleton of Permian Gondollela of Paraná Basin, Brasil; Project in biostratigraphy, palaeoecology and isotope analysis in conodonts of Pennsylvanian of Amazonas Basin, Brasil. Personal items of interest: I'm probably moving out this year from UFPel – Universidade Federal de Pelotas (Pelotas city) for UFRGS – Universidade Federal do Rio Grande do Sul (Porto Alegre city) in the same State but in a different county. This will be much better for my research in conodonts because the Brazilian studies and students of conodonts are concentrated in the UFRGS University.
Sevastopulo, George. Conodont faunas across the Tournaisian/Viséan and the Viséan/ Serpukhovian boundaries. Irish Serpukhovian and Pennsylvanian conodont faunas
Shen, Shuzhong. L. Permian conodonts from Iran and S. China.
Simpson, Andrew. A quiet year for conodont work, have managed to contribute to a manuscript on the Boree Creek sequence through the Early Silurian Ireviken Event in NSW with Peter Molloy (MUCEP).
Slavik, Ladislav. Integrated stratigraphy of the late Silurian in the Prague Synform.
Sloan, Terry. No new conodont activity.
Smith, Paul. Work continues on apparatus architecture and on Cambro-Ordovician conodonts from the NE Laurentian margin.
Snigireva, Maria.* U. Devonian of the Urals, especially the Frasnian/Famennian boundary (ongoing).
Spalletta, Claudia. Late Devonian and Early Carboniferous conodonts from the Carnic Alps, especially focusing on the Frasnian–Famennian and Devonian–Carbonifeorus boundaries.
Spencer, Lee.* Late Cambrian through Early Ordovician conodonts from the southern Appalachians compared with Utah (ongoing).
Sudar, Milan. Triassic conodonts and biostratigraphy of Serbia; Mississippian biostratigraphy based on conodonts and ammonoids (with D. Korn, Berlin) from SW Serbia. Personal items of interest: In November, 2009 he was elected corresponding member of the Serbian Academy of Sciences and Arts.
Suttner, Thomas. Siluro–Devonian conodonts from Austria (Carnic Alps, Graz Paleozoic, and southern Burgenland).
Sweet, Walt. During the last year, a short tribute to Christian Pander, co-authored with Barry Cooper, was published in Episodes.
Szaniawski, Hubert. Structure and palaeobiology in generall and stratigraphy of the Silurian–Devonian transition.
Takahashi, Satoshi. Geochemical studies of Permian/Triassic boundary and Olenekian/ Anisian boundary (Lower Triassic- Middle Triassic) from Japan and New Zealand. Personal items of interest: Third year as a Ph.D. student. Analyzing samples from the Permian–Triassic sections of Japan and New Zealand. Working on Ph.D. thesis.
Talent, John A. Reports that 2009 saw publication of a paper (Joachimski et al.) on reconstructing the latest Silurian–Devonian climate curve from oxygen isotopes in conodonts; much of the database of isotope analyses was derived from conodonts obtained by Ruth Mawson and John over the past 30 years from numerous horizons in eastern Australian. An additional paper (with Lennart Jeppsson *et al*.) on the Lau Event (mid-Late Silurian), mainly based on conodont data, is in press in the International Year of Planet Earth volume: *Earth and Life: Global Biodiversity, Extinction Intervals and Biogeographic Perturbations through Time.*
Tarabukin, Vladimir.* Biostratigraphy and conodonts of the Devonian of NE Russia (in progress).
Trotter, Julie.* Geochemical proxies (Sr & O isotopes, trace elements, rare earth elements) for understanding palaeoenvironment and palaeoclimatology, specifically employing high resolution *in situ* laser ablation and ion microprobe technologies; *in situ* oxygen isotope conodont thermometry methods using ion microprobe (SHRIMP).
Uyeno, Tom. Middle and Upper Devonian conodonts from Mackenzie Mtns., N. Cordillera, Canada
Valenzuela-Ríos, Jose.* Conodont bio- and chronostratigraphy of neritic and pelagic facies in sections from Spain (Spanish Central Pyrenees, Iberian Chains, Ossa Morena, Catalonian Coastal Ranges), Germany (Frankenwald, Rhenish Slate Mtns., Thuringia), Czech Republic (Prague Synform), USA (Central Nevada), Andorra (Tor-Casamanya Syncline), Uzbekistan (Zinzilban Gorge). Global correlation, mainly for Pridoli to Emsian, but also Middle and Upper Devonian. Correlation of conodont biostratigraphy with other co-occurring groups, mainly fish, brachiopods, ostracods and dacryoconarids.
Viira, Viive. Ordovician and Silurian conodont biostratigraphy of Estonia, mainly Lower and Middle Ordovician conodonts.

Von Bitter, Peter. Retired, but trying to finish papers with Glen Merrill, Rod Norby, and Mark Purnell on Pennsylvanian *Gondolella*, Mississippian *Lochriea*, and Silurian *Wurmiella*, *Ctenognathodus* and *Aldridgeodus* apparatuses, respectively. Also trying to complete eastern Canadian Mississippian Windsor and Codroy group conodont studies. The operative word seems to be "trying" !!!

Wang, Cheng-yuan. Silurian conodonts of China; Devonian conodonts of China; Upper Permian conodonts from Sichuan; A review of conodont zonation of the Permian–Triassic boundary beds.

Wankiewicz, **Aleksandra.** Finishing Ph.D. thesis entitled "Slope deposits of the Late Devonian carbonate platform of the Holy Cross Mountains, Poland". Biostratigraphic data will be published late this year or early 2011, after the defence.

Wardlaw, Bruce. Permian, Carboniferous, Lower Triassic and Geologic Map and Stratigraphic Interpretation of the Marble Canyon area, Death Valley National Park, Inyo County, California (Carboniferous and Permian Conodonts). Personal items of interest: Adjunct Professor, University of Texas at Arlington, Arlington, Texas.

Wheeley, James. 2008-2009: Researching the oxygen isotope composition of selected Ordovician and Silurian taxa with the NERC ion microprobe at the University of Edinburgh. Working with Paul Smith on this project.

Whiteside, Joe.* Biostratigraphy and chronostratigraphy of the subsurface Lr. Carboniferous, Fort Worth Basin, Texas.

Witzke, Brian.* Famennian conodont biostratigraphy of Iowa.

Woroncowa-Marcinowska, Tatiana. Working on Middle and Upper Devonian conodont biostratigraphy of the Holy Cross Mts. In the near future the work about Givetian conodont biostratigraphy of the Łysogóry region (Holy Cross Mts.) will be finished.

Wu, Rongchang.* Ordovician conodont biostratigraphy in S. China (Ph.D. thesis).

Yao, Jianxin. Working on Late Paleozoic and Triassic conodonts of South China and Ordovician–Triassic stratigraphy in Tarim Basin, Kunlun Mtns. and Tibet.

Yoshida, Takashi. Age of conodonts, especially comparisons with radiolarian age. Personal item of interest: Retirement from the Geological Survey of Japan.

Zhang, Huaqiao. Histology of paraconodonts and earliest euconodont.

Zhang, Shunxin. Studying Late Ordovician conodonts from Southampton Island and southern Ontario, as well as from limestone xenoliths in Slave Craton.

Zhen, Yong Yi. Working on the Ordovician conodonts from New South Wales, Tasmania, New Zealand, Tarim Basin and South China.

Zhuravlev, Andrey. Devonian–Permian conodonts of the East European Platform, North of Urals, Pay-Khoy, and Russian FarEast. Main attention is paid to conodont palaeobiology. Study of microstructure of conodont hard tissues in collaboration with E. Rosseeva (St.Petersburg University) is continuing.

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AGEMATSU, S., M.J. ORCHARD, AND K. SASHIDA. 2008. Reconstruction of an apparatus of *Neostrachanognathus tahoensis* from Oritate, Japan and species of Nesotrachanognathus from Oman. Palaentology, 51(5):1201-1211.

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ALBANESI G.L., M. JOHNS, AND G.G. VOLDMAN. In Press. Fresh-water shark teeth from the Triassic Paramillo Formation in the Mendoza Precordillera, Argentina. Reunión Anual de Comunicaciones de la Asociación Paleontológica Argentina, Buenos Aires, 25-27 noviembre 2009. Abstract.

ALDRIDGE, R.J. 2009. The composition and architecture of primitive prioniodontid conodont apparatuses: a state-of-the-science review. *In* Henderson C. M. and C. MacLean (Eds) ICOS 2009, Calgary (Canada), Permophiles, 53, Supplement 1, Abstract: 2-3.

ALDRIDGE, R.J., AND D.E.G. BRIGGS. 2009. The discovery of conodont soft tissue anatomy and its importance for understanding the early history of vertebrates. *In* Sepkoski D. and M. Ruse(Eds). The Paleobiological Revolution. University of Chicago Press:73-88.

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ALEKSEEV, A.S., N.V. GOREVA, T.N. ISAKOVA, AND O.L. KOSSOVAYA. 2009. Stratotype of Gzhelian Stage (Upper Carboniferous) in Moscow Basin, Russia. Tipovye razrezy karbona Rossii I potentsialnye globalnye stratotipy. Yuzhnouralskaya sessiya. Meterialy mezhdunarodnogo polevogo sovestshaniya. Ufa-Sibay, 13-19 avgusta, 2009. Ufa:165–177 [In Russian].

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Addresses and Contact Information

Asterisk: no report for 2010; information from the Newsletter 2009*

AGEMATSU, Sachiko*
Graduate School of Life and Environmental Sciences, University of Tsukuba,
Ibaraki 305-8572, Japan
Tel. 029 853 7175
e-mail agematsu@geol.tsukuba.ac.jp

ALBANESI, Guillermo L.
CONICET – Museo de Paleontologia
Universidad Nacional de Cordoba
Av. Velez Sarsfield 299, Casilla de Correo 1598
5000 Cordoba, Argentina
Tel. 54 (0)351 4332098 (int.256)
e-mail galbanesi@arnet.com.ar

ALDRIDGE, Richard J.
Department of Geology, University of Leicester
Leicester LEI 7RH, U.K.
Tel. +116 252 3610
e-mail ra12@le.ac.uk

ALEKSEEV, Alexander S.
Department of Paleontology, Geol. Faculty
Moscow State University, Leninskie Gory,
Moscow, 119991 GSP-1, RUSSIA
Tel. 007 495 939 4924
e-mail aaleks@geol.msu.ru

ARMSTRONG, Howard A.*
Department of Earth Science, University of Durham. Science Labs,
South Road, Durham DH6 5NN, U.K.
Tel. 0044 0 191 3342320
e-mail h.a.armstrong@durham.ac.uk

ARTYUSHKOVA, Olga V.
Institute of Geology of the Ufimian Scientific Centre RAS,
Karl Marx Street 16/2, Ufa Bashkortostan
450000, Russia
Tel +79273363318
e-mail stpal@anrb.ru

AUSTIN, Ronald L.*
21 Bellevue Road, Swansea SA3 5QB, U.K.
Tel. 01792 404260

BADER, Jeremy
Halliburton Energy Services
777 Main St. Suite 1160, Fort Worth,
TX 76102, U.S.A.
Tel. 817-333-1134
e-mail jeremy.bader@halliburton.com

BAGNOLI, Gabriella
Dipartimento di Scienze della Terra
Università di Pisa, Via S. Maria 53
56126 Pisa, Italy
Tel. +39 050 2215768
e-mail bagnoli@dst.unipi.it

BANCROFT, Alyssa*
2787 Calumet Street, Apt. B
Columbus, Ohio 43202, U.S.A.
e-mail Bancroft.10@osu.edu

BARDASHEV, Igor A.
Institute of Geology Academy of Science RT
14 Rahimzoda st.,
Dushanbe, 734 003 Tajikistan
Tel. 992 372 28 91 44
e-mail paot@tajik.net (under 100Kb)
timur.idrisov@gmail.com (more 1Mb)

BARDASHEVA, Nina P.
Institut of Geology Academy of Science RT
14 Naberezhnaya st.,
Dushanbe, 734 003 Tajikistan
Tel. 992 372 28 91 44
e-mail paot@tajik.net (under 100 Kb)
timur.idrisov@gmail.com (more 1Mb)

BARNES, Christopher R.
NEPTUNE Canada, University of Victoria
P.O. Box 1700, STN CSC
Victoria, B.C. V8W 2Y2 Canada
Tel. 250 472 5350
e-mail crbarnes@uvic.ca

BARRICK, James E.
Department of Geosciences, Texas Tech University, MS 1053, Lubbock, TX 79409-1053, U.S.A.
Tel. + 01 806 742 3107
e-mail jim.barrick@ttu.edu

BARSKOV, Igor S.*
Dept. of Paleontology, Geological Faculty
Moscow State University
119992 Moscow GSP-2, Russia
e-mail ibarskov@geol.msu.ru

BAUER, Jeff
Shawnee State University
Department of Natural Sciences,
940 Second Street,
Portsmouth, Ohio 45662, U.S.A.
Tel. +01 740 351 3421
e-mail jbauer@shawnee.edu

BELKA, Zdzislaw
Institute of Geology, Adam Mickiewicz University ul. Dziegielowa 27,
PL 61-680 Posnan, Poland

Tel. 0048 600 271 456
e-mail zbelka@amu.edu.pl

BENDER, Peter*
Alter Kirchhainer Weg 15,
D-35039 Marburg, Germany
Tel. +49 (0)6421-27314
e-mail dr-peter-bender@gmx.de

BENFRIKA, El Mostafa*
University Hassan II – Mohammedia,
Faculty of Sciences Ben M'Sik
B.P. 7955, Sidi Othmane
Casablanca, Morocco
Tel. 00212 677119905
e-mail benfrikael@hotmail.com

BERGSTRÖM, Stig
School of Earth Sciences
Division of Geological Sciences
The Ohio State University
155 S. Oval Mall
Columbus, OH 43210, U.S.A.
Tel. (with voice mail)
614 292 4473 (office)
e-mail stig@geology.ohio-state.edu

BERKYOVA, Stana*
Czech Geological Survey
Klarov 3, Prague 1, Czech Republic
Tel. +420 251 085141
e-mail berkyova.s@seznam.cz

BIKBAEV, Alexander*
Institute of Geology and Geochemistry of the
Urals Branch, Russian Academy of Sciences,
Pochtovy per., 7, 620000 Ekaterinburg, Russia
e-mail sveta@igg.uran.ru

BLANCO-FERRERA, Silvia*
Dpto. de Geolog a. Universidad de Oviedo
C/Arias de Velasco s/n
33005 Oviedo, Asturias, Spain
Tel. 34 985 102884
e-mail silvia.blanco@geol.uniovi.es

BONCHEVA, Iliana
Dept. of Paleontology, Stratigraphy and
Sedimentology, Geological Institute,
Bulgarian Academy of Sciences,
Acad. G. Bonchev Str., Bl. 24, Bulgaria,
Sofia 1113
Tel. ++359 2 979 2225
e-mail boncheva2005@yahoo.com

BRIGHT, Camomilia*
Iowa State University
253 Science I
Ames, IA 50011, U.S.A.
Tel. 515 275 2397
e-mail cabright@iastate.edu

BROWN, Lewis M.
Lake Superior State University
650 W. Easterday Ave.,
Sault Ste Marie, MI 49783
Tel. 906 635 2155
e-mail lbrown@lssu.edu

BULTYNCK, Pierre
Royal Belgian Institute of Natural Sciences
Vautierstraat, 29
B-3000 Brussels, Belgium
Tel. 32 2 62744 486
e-mail pierre.bultynck@naturalsciences.be

BURYI, Galina I.*
Far East Geological Institute
Far East Branch Russian Academy of Sciences
Prospect 100-letya, 159 Vladivostok
690022 – Russia
Tel. (4232) 318 750
e-mail buryi@mail.ru or gburyi@hotmail.com

CAPKINOGLU, Senol*
KTU Department of Geology
61080 Trabzon, Turkey
e-mail capkin@ktu.edu.tr

CAREY, Stephen
Geology Deparment
University of Ballarat
P.O. Box 663,
Ballarat, Vic 3350, Australia
Tel. +61 3 5327 9268
e-mail s.carey@ballarat.edu.au

CASTELLO, Veronica*
Universitat de Valencia
C/Doctor Molinell, 50.46100
Burjassot, 46100 Valencia, Spain
e-mail veronica.castello@uv.es

CHARPENTIER, Ronald R.
U.S. Geological Survey
MS939 Box 25046, Denver Federal Center
Denver, CO 80225, U.S.A.
Tel. 303 236 5766
e-mail charpentier@usgs.gov

CHEN, Jun*
Nanjing Institute of Geology and Palaeontology

39 East Beijing Road,
Nanjing, PRC
Tel. +86 25 83282184
e-mail junchencas@yahoo.com.cn

CLARK, David*
University of Wisconson,
Madison, USA
e-mail dlclarksr@sbcglobal.net

COLE, Damian*
Dept. of Earth & Planetary Sciences
Macquarie University
NSW 2109, Australia
e-mail djcole@tpg.net.au

CORRADINI, Carlo
Dipartimento di Scienze della Terra
Universita di Cagliari
Via Trentino 51, I-09127 Cagliari, Italy
Tel. (+39) 070 6757744
e-mail corradin@unica.it

CORRIGA, Maria Giovanna
Dipartimento di Scienze della Terra
Universita di Cagliari
Via Trentino 51, I-09127 Cagliari, Italy
e-mail maria.corriga@unica.it

DAY, Jed*
Department of Geography-Geology
Illinois State University
Normal, IL 61790-4400, U.S.A.
Tel. 309 438 8678
e-mail jeday@ilstu.edu

DONG Xiping
School of Earth and Space Sciences
Peking University, Beijing 100871, P.R.China
Tel. 86 10 62753604
e-mail dongxp@pku.edu.cn

DONOGHUE, Philip C.J.
Department of Earth Sciences
University of Bristol
Wills Memorial Building, Queens Road
Bristol BS8 1RJ, U.K.
Tel. +44 (0)117 954 5440
e-mail phil.donoghue@bristol.ac.uk

DOPIERALSKA, Jolanta
Isotope Laboratory,
Adam Mickiewicz University
ul. Dziegielowa 27,
PL 61-680 Posnan, Poland
Tel. 0048 61 829 6044
e-mail dopieralska@amu.edu.pl

DUMOULIN, Julie A.
U.S. Geological Survey
4200 University Dr.,
Anchorage, AK 99508-4667, USA
Tel. +1 907 786 7439
e-mail dumoulin@usgs.gov

DUSAR, Michiel
Geological Survey of Belgium
Jenner str. 13, B-1000 Brussels, Belgium
Tel. +32 2 788 7632
e-mail michiel.dusar@naturalsciences.be

DZIK, Jerzy
Instytut Paleobiologii PAN
Twarda 51/55 00-818 Warszawa, Poland
Tel. +48 22 697 8738
e-mail dzik@twarda.pan.pl

ETHINGTON, Raymond L.
Department of Geological Sciences
University of Missouri-Columbia
Columbia, Missouri 65211, USA
Tel. 573 882 6470
e-mail EthingtonR@missouri.edu

FERRETTI, Annalisa
Dipartimento di Scienze della Terra, Università
di Modena e Reggio Emilia, L.go S. Eufemia 19,
I-41100 Modena, Italy
Tel. +39 059 205 5868
e-mail ferretti@unimore.it
web: http://www.prg.unimore.it

FUREY-GREIG, Terry
3 Mason St, Kandos, NSW 2484, Australia
e-mail tfurey@aapt.net.au

GARCIA-LOPEZ, Susana
Depart. de Geologia, Universidad de Oviedo
c/o Arias de Velasco s/n,
33005 Oviedo, Spain
Tel. 34 985 103124
e-mail sgarcia@geol.uniovi.es

GATOVSKY, Yury A.
Dept. of Paleontology, Geological Faculty,
Moscow State University
119991 Moscow GSP-1, Russia
Tel. 007 495 9394960
e-mail ustas62@bk.ru

GEDIK, Ismet*
Karadeniz Technical University,

Geology Department, 61080 Tabzon-Turkey
Tel. 90 462 3772743
e-mail isgedik@ktu.edu.tr

GHOLAMALIAN, Hossein
Department of Geology,
Faculty of Sciences
Hormozgan University, Po. Box 3995,
Bandar Abbas, I.R. IRAN
e-mail hossein.gholamalian@yahoo.com

GIRARD, Catherine*
Universite Montpellier 2
UMR 5554, ISEM, CC64
Place Eugene Bataillon
34095 Montpellier
Tel. 33/(0)4 67 14 49 17
e-mail Catherine.girard@univ-montp2.fr

GOLDING Martyn,
Department of Earth and Ocean Science,
University of British Columbia
6339 Stores Road, Vancouver,
British Columbia, V6T 1Z4,
Tel 604 822 6180
e-mail mgolding@eos.ubc.ca

GOUDEMAND, Nicholas
Palaeontological Institute & Museum
University of Zurich
Karl Schmid-Strasse 4
CH-8006 Zurich, Switzerland
Tel. ++41 44 634 2698
e-mail goudemand@pim.uzh.ch

GOUWY, Sofie*
Università di Modena e Reggio Emilia
Largo Santa Eufemia 19
I-4110-0 Modena, Italy
e-mail sofiegouwy@yahoo.com

GROESSENS, Eric
Chef de Travaux
Geological Survey of Belgium,
Jennerstreet, 13 – B- 1000 Brussels,
Belgium
Tel. +32 2 731 98 77
e-mail eric.groessens@naturalsciences.be

HAIRAPETIAN, Vachik*
Khorasgan Branch, PO Box 81595-158
Esfahan, Iran
e-mail vh_hai@yahoo.com
or vachik@khuisf.ac.ir

HALL, Jack C.
University of North Carolina Wilmington
601 South College Road
Wilmington, NC 28403, U.S.A.
Tel. 910 962 3488
e-mail hallj@uncw.edu

HARRIS, Anita G.*
U.S. Geological Survey
Denver Federal Center, MS 973
Denver, CO 80225, U.S.A.
Tel. 303 236 1815
e-mail ahcono@comcast.net

HECKEL, Phil
Department of Geoscience,
University of Iowa
Iowa City, IA 52242, U.S.A.
Tel. 319 335 1804
e-mail philip-heckel@uiowa.edu

HENDERSON, Charles M.
Department of Geoscience, 2500 University
Drive, University of Calgary, Calgary, AB,
Canada T2N 1N4
Tel. +1 403 220 6170
e-mail charles.henderson@ucalgary.ca

HERBIG, Hans-Georg
Institut für Geologie und Mineralogie
AG Paläontologie und Historische Geologie
Universität zu Köln
Zülpicher Str. 49a
D-50674 Koln, Germany
Tel. +49 221 470 2533
e-mail herbig.paleont@uni-koeln.de

HIRSCH, Francis*
Naruto University of Education
159-23 Aza Hanamen-Satoura-Cho
Naruto-Shi, Tokushima Prefecture, 772-002
Japan
Tel/Fax +81 (088) 686 7723
E-mail abafran@gmail.com

HISAHARU, Igo*
Tokyo Gakugei University
Dept. Astronomy & Earth Sciences
4-1-1 Nukui Kitama-machi,
Koganei City, Tokyo 184-8501
Tel. 042 329 7531
Fax 042 329 7538
e-mail [o] igohisa@u-gakugei.ac.jp
[h] igokuro@mtj.biglobe.ne.jp

HISAYOSHI, Igo
Institute of Natural History

Highlife B-1, Takada 3-14-24,
Toshima, Tokyo 171-0033, Japan
Tel. +81 3 5992 9153
e-mail igohisa@mac.com
or igohisay@beige.plala.or.jp

ISHIDA, Keisuke
Laboratory of Geology, Faculty of Sciences,
Institute of Socio-Arts and Sciences
University of Tokushima
Minamijosanjima 1-1, Tokushima 770-8502
Japan
Tel./Fax +81 88 656 7243
e-mail ishidak@ias.tokushima-u.ac.jp

ISOZAKI, Yukio
University of Tokyo
Dept. Earth Science & Astronomy
3-8-1 Komaba, Meguro
Tokyo 153-8902, Japan
Tel. 81 3 5454 6608
e-mail isozaki@ea.c.u-tokyo.ac.jp

IZOKH, Nadezhda G.
Trofimuk Institute of Petroleum Geology &
Geophysics, Siberian Branch RAS
Acad. Koptyug av. 3,
Novosibirsk 630090, Russia
Tel. (383) 333 24 31
e-mail IzokhNG@ipgg.nsc.ru

JEPPSSON, Lennart
Dept. of Geology, Geocentrum II,
Lund University, Dalslandsvägen 3,
S 222 25 Lund, Sweden
Tel. +46 46 131 299
e-mail Lennart.Jeppsson@email.com

JIANG Haishui
Faculty of Earth Sciences, China University
of Geosciences, 388 Lumo Road, Wuhan,
Hubei Province, China, 430074
Tel. 086 27 67883021
e-mail jiangliuis@hotmail.com

JOHNSTON, David Ian
Devord Consulting Ltd
103 – 3017 Blakiston Dr. NW
Calgary, AB, Canada T2L 1L7
Tel. 403 284 0405
e-mail johnstda@shaw.ca

JONES, David*
University of Leicester
University Road, Leicester, LE2 1HB, UK
[Note] Temporarily relocating to Monash
University, Melbourne during summer 2009
e-mail doj2@le.ac.uk

JONES, Gareth L.*
7 Dundrum Business Park
Windy Arbor
Dublin 14, Ireland
Tel. 00 353 1 296 51 51
e-mail conodate@mac.com

KAISER, Sandra L.
Steinmann Institute (Palaeontology)
University Bonn
Nussallee 8, 53115 Bonn, Germany
Tel. +49 (0)228 734 683
e-mail sakaiser@uni-bonn.de

KATVALA, Erik C.*
University of Calgary
2500 University Drive, N.W.
Calgary, AB T2N 1N4, Canada
Tel. 403 220 3271
e-mail erik.katvala@ucalgary.ca

KILIC, Ali Murat*
Balikesir University, Dept. of Geological Eng.
Cagis Kampusu 10145 Balikesir
Turkey
Tel. +90 266 612 11 94 (ext 5401)
e-mail alimurat@balikesir.edu.tr or
dr.alimurat@hotmail.com

KIRCHGASSER, William
SUNY Potsdam
Potsdam, N.Y. 13676, U.S.A.
Tel. 315 212 5243 (cell)
e-mail kirchgwt@potsdam.edu

KIRILISHINA, Elena M.*
Dept. of Paleontology, Geological Faculty
Moscow State University
119992 Moscow GSP-2, Russia
Tel. 007 095 939 4960
e-mail conodont@mail.ru

KLAPPER, Gilbert
Visiting Professor, Northwestern University
Home address, for all postal mail:
1010 Eastwood Road, Glencoe,
IL 60022-1125, U.S.A.
Tel. 847 732 1859
e-mail g-klapper@northwestern.edu

KLEFFNER, Mark A.

School of Earth Sciences, The Ohio State University at Lima. 4240 Campus Drive, Lima, OH 45804-3576, U.S.A.
Tel. 419 995 8208
e-mail kleffner.1@osu.edu

KOIKE, Toshio*
Tokiwadai 36-6-606
Hodogaya-ku
Yokohama City, Japan 240-0067
Tel./Fax 045 335 6274
e-mail koike@ed.ynu.ac.jp

KOLAR-JURKOVŠEK, Tea
Geological Survey of Slovenia
Dimiceva ulica 14
SL-1000 Ljubljana, Slovenia
Tel. 0038 612809739
e-mail tea.kolar@geo-zs.si

KÖNIGSHOF, Peter
Senckenberg Research Institute and Natural History Museum Frankfurt
Senckenberganlage 25
D-60325 Frankfurt am Main, Germany
Tel. ++49 (69) 97075 1686
e-mail Peter.Koenigshof@senckenberg.de

KONONOVA, Ludmila I.*
Dept. of Paleontology, Geological Faculty
Moscow State University
119992 Moscow GSP-2, Russia
Tel. 007 095 939 4960
e-mail conodont@mail.ru

KOVACS, Sandor*
Geological Research Group of the Hungarian Academy of Sciences
Pazmany Peter setany 1/C
H-1117 Budapest, Hungary
Tel. 36 1 381 2127
e-mail skovacs@iris.geobio.elte.hu or sandor.kovacs@geology.elte.hu

KOZUR, Heinz W.
Rezsü u. 83
H-1029 Budapest, Hungary
Tel. 00361 397 1316
e-mail kozurh@helka.iif.hu

KRAHL, Jochen*
Agnesstrasse 45
D-80798 Munich, Germany
e-mail spectroworld@t-online.de

KRESJA, Richard J.*
Cal Poly State University
189 San Jose Court
San Luis Obispo, CA 93495, U.S.A.
Tel. 805 544 3399
e-mail rkrejsa@calpoly.edu

KRUMHARDT, Andrea*
University of Alaska Fairbanks
Department of Geology & Geophysics
P.O. Box 755780
Fairbanks, Alaska 99775, U.S.A.
Tel. 907 474 5313
e-mail fnapk@uaf.edu

LAI Xulong
Faculty of Earth Sciences
China University of Geosciences
Wuhan, Hubei 430074 China
Tel. 86 27 6788 3003
e-mail xllai@cug.edu.cn or xllaicug@163.com

LAMBERT, Lance L.*
Department of Geological Sciences
The University of Texas at San Antonio
One UTSA Circle
San Antonio, Texas 78249-0663, U.S.A.
Tel. 210 458 5447
e-mail lance.lambert@utsa.edu

LANE, H. Richard*
National Science Foundation
4201 Wilson Blvd., Room 789,
Arlington, Virginia 22230, U.S.A.
Tel. 703 292 4730
e-mail hlane@nsf.gov

LANG, Jiabin
Research Center of Paleontology & Stratigraphy, Jilin University
6 Ximinzhu Street, Changchun 130026, China
Tel. 0086 13630598356
e-mail langjiabin1982@yahoo.com.cn

LEATHAM, W. Britt
Dept. Geological Sciences
California State University San Bernardino
5500 University Parkway
San Bernardino, CA 92407, USA
Tel. 909 537 5322
e-mail bleatham@csusb.edu

LEHNERT, Oliver*
Geozentrum Nordbayern
Schlossgarten 5
D-91054 Erlangen, Germany
Tel. +49 9131 852 2632

e-mail lehnert@geol.uni-erlangen.de

LESLIE, Stephen A.
Dept. of Geology and Environmental Science
James Madison University,
800 South Main St., MSC 6903
Harrisonburg, VA 22807, U.S.A.
Tel. 540 568 6144
e-mail lesliesa@jmu.edu

LIAO, J.-C. (Teresa)*
Dpt. de Geologia, Universitat de Valencia
C/ Dr. Moliner 50
E-46100 Burjassot, Valencia, Spain
Tel. 34 96 354 3412
e-mail jau.liao@uv.es

LIU, Jianbo*
Department of Geology,
Peking University
Haidian, Beijing 100871, P.R. China
Tel. +86 10 62754151
e-mail jbliu@pku.edu.cn

LŐFGREN, Anita
Institute of Geology
Lund University
Sölvegatan 12
SE-223 62 Lund, Sweden
Tel. +46 46 15 2406
e-mail anita.lofgren@geol.lu.se

LUPPOLD, Friedrich W.
LBEG–Landesamt f. Bergbau,
Energie und Geologie,
Stilleweg 2, 30655 Hanover, Germany
Tel. 04 0511 643 2514
e-mail FriedrichWilhelm.Luppold@lbeg.
niedersachsen.de

MACHADO, Gil*
Portugal
e-mail machadogil@gmail.com

MacKENZIE, Peter*
MacKenzie Land & Exploration, Ltd.
P.O. Box 166, 660 High St., Suite 201
Worthington, OH 43085, U.S.A.
Tel. 614 785 1682
e-mail pete@mackex.com

MÄNNIK, Peep
Institute of Geology
Tallinn University of Technology
Ehitajate tee 5, Tallinn 19086
Estonia
Tel. +372 6203041
e-mail mannik@gi.ee

MANSHIP, Lori
University of Texas Permian Basin
4901 E. University
Odessa, Texas 79762, U.S.A.
Tel. 1 432 552 2245
e-mail manship_l@utpb.edu

MARQUEZ-ALIAGA, Ana
Dpt. de Geologia, Universitat de Valencia
C/ Dr. Moliner 50
E-46100 Burjassot, Valencia, Spain
Tel. +34 96 354 4396
e-mail Ana.Marquez@uv.es

MARSHALL, Richard T.*
22944 Armadillo Road
Garfield, AR 72732, U.S.A.
Tel. 479 359 2104
e-mail mars@centurytel.net

MARTINEZ PEREZ, Carlos*
Dpt. de Geologia, Universitat de Valencia
C/ Dr. Moliner 50
E-46100 Burjassot, Valencia (Spain)
Tel. 34 96 354 4602
e-mail Carlos.Martinez-Perez@uv.es

MASLOV, Viktor A.*
Institute of Geology, Ufa Research Centre
Russian Academy of Science
Karl Marx Street 16/2
Ufa 450000, Russia
e-mail stpal@anrb.ru

MASON, Charles*
Moorehead State University
375 Gene White Lane,
Morehead, KY 40351, U.S.A.
Tel. 606 783 2166
e-mail c.mason@moreheadstate.edu

MASTANDREA, Adelaide
Dipartimento di Scienze della Terra
Università della Calabria
Ponte Bucci, cubo 15b,
Arcavacata di Rende (CS), I-87036 Italy
Tel. +39 984 493651
e-mail a.mast@unical.it

MATHIESON, David
Earth & Planetary Sciences, Macquarie
University, NSW 2109, Australia

MATYJA, Hanna
Polish Geological Institute
Rakowiecka 4, 00-975 Warsaw, Poland
Tel. +48-22 841 5351 (ext. 499)
e-mail hanna.matyja@pgi.gov.pl

MAWSON, Ruth
Earth & Planetary Sciences, Macquarie
University, NSW 2109, Australia
Corresponding address: 228 Ridgecrop Drive,
Castle Hill, NSW 2109, Australia
Tel. 61 296 341815
e-mail rmawson37@gmail.com

MacKENZIE, Peter*
MacKenzie Land & Exploration, Ltd.
P.O. Box 166, 660 High St. Ste 201,
Worthington, OH 43085, U.S.A.
Tel. 614 785 1682
e-mail pete@mackex.com

McCRACKEN, Alexander (Sandy)
Geological Survey of Canada
3303-33rd St. NW
Calgary, Alberta T2L 2A7, Canada
Tel. 403 292 7130
e-mail samccrac@NRCan.gc.ca

McHARGUE, Tim*
Chevron Energy Technology Co.
6001 Bollinger Canyon Rd
San Ramon, CA 94583, U.S.A.
Tel. 925 842 6255
e-mail timmchargue@chevron.com

MEÇO, Selam
Universiteti Politeknik
Fakulteti Gjeologji-Miniera
Labinoti
Tirana, Albania
Tel. ++355 437 5246
++ 355 437 1607 (private)
e-mail smeco_2001@yahoo.com

MEDINA VAREA, Paula*
Departamento de Paleontologia
Facultad de Ciencias Geologicas
Universidad Complutense de Madrid
C/Jose Antonio Novais No. 2
28040 Madrid, Spain
e-mail pmvarea@geo.ucm.es

MEISCHNER, Dieter*
Am Weendelsgraben 6
D-37077 Goettingen, Germany
Tel. 49 551 2 05 30 75
e-mail hydromare@t-online.de

Mėndez, Carlos A.
Department of Geology (Paleontology)
University of Oviedo
Campus de Llamaquique
33005 Oviedo, Asturias, Spain
Tel. 34 985 103136
e-mail cmendez@geol.uniovi.es

MERRILL, Glen
Department of Natural Sciences
University of Houston-Downtown
1 Main Street
Houston, TX 77002, U.S.A.
Tel. 713 221 8168
e-mail merrillg@uhd.edu

METCALFE, Ian*
Earth Sciences, School of Environmental &
Rural Science, University of New England
Armidale, NSW 2351, Australia
Tel. +61 2 67733499
e-mail imetcal2@une.edu.au

METZGER, Ronald*
Southwestern Oregon Community College
1988 Newmark Avenue
Coos Bay, Oregon 97420-2912, U.S.A.
Tel. 541 888 7216
e-mail rmetzger@socc.edu

MIKAMI, Teiji,
Kyoto University of Education
Fukakusa Fujinomori-cho,
Fushimiku, 612-8522, Kyoto City, Japan
Tel. +81 90 6062 7518
e-mail rcacky@goo.jp

MILLER, C. Giles
Department of Palaeontology
Natural History Museum
Cromwell Road, South Kensington,
London SW7 5BD, U.K.
Tel. 0044 7942 5415
e-mail G.Miller@nhm.ac.uk

MILLER, James F.
Geography, Geology & Planning
Missouri State University
Springfield, MO 65897, U.S.A.
Tel. 417 836 5447
e-mail JimMiller@MissouriState.edu

MOLLOY, Peter
Earth & Planetary Sciences

Macquarie University
NSW 2109, Australia
Tel. 61 2 944 95871
e-mail peter.molloy@ozemail.com.au

MURPHY, Michael A.*
2324 Oakenshield Road
Davis, California 95696, U.S.A.
Tel. 916 758 0289
e-mail mamurphyd@adelphia.net

NAKREM, Hans Arne
Natural History Museum (Geology)
University of Oslo,
P.O. Box 1172 Blindern
NO-0318 Oslo, Norway
Tel. 0047 92463785 (mobile)
e-mail h.a.nakrem@nhm.uio.no

NARKIEWICZ, Katarzyna
Polish Geological Institute-
National Research Institute
Rakowiecka 4, 00-975 Warszawa, Poland
Tel. (48-22) 849 53 51 329
e-mail katarzyna.narkiewicz@pgi.gov.pl

NASCIMENTO, Sara*
UFRGS – Universidade Federal do Rio Grande
do Sul, Instituto de Geosciencias,
Av. Bento Goncalves, 9500
Predio 43127 sala 211
Tel. 055 051 33086391
e-mail aiatha@yahoo.com.br

NAVAS-PAREJO, Pilar
Department of Stratigraphy & Palaeontology
Campus Fuentenueva s/n 18071, Granada, Spain
Tel. +34 635 828008
e-mail png@ugr.es

NAZAROVA, Valentina M.*
Dept. of Paleontology, Geological Faculty
Moscow State University
119992 Moscow GSP-2, Russia
Tel. 007 095 939 4960
e-mail VM516@yandex.ru

NEMYROVSKA, Tamara I.
Institute of Geological Sciences
Nat. Academy of Sciences of Ukraine
O.Gonchar Str. 55-b
01054 Kiev, Ukraine
Tel. +380 44 238 1943
Home +380 44 278 63 40
e-mail tnemyrov@i.com.ua
or tenemyrov@mail.ru

NICOLL, Robert S.
29 Hooper Crescent
Flynn, ACT, Australia 2615
Tel. (h) 61 2 6258 4140
e-mail bnicoll@velocitynet.com.au or
bob.nicoll@ga.gov.au

NICORA, Alda
Dept. Earth Sciences "A. DESIO"
Mangiagalli 34, 20133 MILANO - I
Tel. +39-02 503 15543
e-mail alda.nicora@unimi.it

NORBY, Rodney D.
Illinois State Geological Survey
615 East Peabody Drive
Champaign, IL 61820, U.S.A.
Tel. 217 244 6947
e-mail norby@isgs.illinois.edu

NOWLAN, Godfrey
Geological Survey of Canada
3303-33rd Street NW
Calgary, AB T2L 2A7 Canada
Tel. 403 292 7079
e-mail gnowlan@NRCan.gc.ca

OBUT, Olga T.
Trofimuk Institute of Petroleum Geology &
Geophysics, Siberian Branch of RAS
Acad. Koptyug av. 3,
Novosibirsk 630090, Russia
Tel. (383) 333 24 31
e-mail ObutOT@ipgg.nsc.ru

ÖNDER, Fuat*
Ipek Consaltancy
Iller sok. 18/8 Mebusevleri-Tandogan
Ankara, Turkey
Tel. 90 312 2156000
e-mail fuat@bilkent.edu.tr

ORCHARD, Michael J.
Geological Survey of Canada
625 Robson St.,
Vancouver, B.C. V6B 5J3, Canada
Tel. 604 666 0409
e-mail morchard@nrcan.gc.ca

OVER, D. Jeffrey
SUNY-Geneseo, 1 College Circle
Geneseo, NY 14454, U.S.A.
Tel. 585 245 5291
e-mail over@geneseo.edu

OWEN, Susan
e-mail pangee3@gmail.com

PARK, Soo-In
Department of Geology. College of Natural Sciences, Kangwon National University,
1 Gangwondaehakgil, Chuncheon City,
Gangwon Province 200-701, South Korea
Tel. 82 33 250 8554
e-mail sweenp@kangwon.ac.kr

PAULL, Rachel*
1657 W. Canal Ct., Littleton,
CO 80120, U.S.A.
Tel. 303 948 6436
e-mail rocdox@comcast.net

PERCIVAL, Ian
Geological Survey of New South Wales
WB Clarke Geoscience Centre
947-953 Londonderry Road
Londonderry NSW 2753, Australia
Tel. 61 2 4777 0315
e-mail ian.percival@industry.nsw.gov.au

PERRET MIROUSE, Marie-France
L.M.T.G., Observatoire Midi-Pyrnes,
14 Avenue Edouard Belin
31400 Toulouse
Tel. 00(0)5 61 33 26 45
e-mail perret@lmtg.obs-mip.fr

PERRI, Maria Cristina
Dipartimento di Scienze della Terra
e Geologico-Ambientale
Alma Mater Studiorum–University of Bologna
Via Zamboni 67, I-40126 Bologna, Italy
Tel. +39 051 209 4560
e-mail mariacristina.perri@unibo.it

PICKETT, John
Geological Survey of New South Wales
Department of Primary Industries
WB Clarke Geoscience Centre
947-953 Londonderry Road
Londonderry NSW 2753, Australia
picketj@bigpond.net.au

PIECHA, Matthias
Geologischer Dienst/Nordrheinwestfalen
De-Greiff-Str. 195,
47803 Krefeld, Germany
Tel. 02151 897575
e-mail piecha@gd.nrw.de

PIERACACOS, Nick
Eagle Oil and Gas Co. Dallas, Texas USA
Corresponding address: 9510 Glenshee Drive,
Rowlett, TX 75089, U.S.,A.
Tel. 972 412 6545
e-mail npieracacos@yahoo.com

PLASENCIA-CAMPS, Pablo
Departament de Geologia
University of Valencia
Dr. Moliner 50, 46100 Burjassot,
Valencia, Spain
Tel. 003496 354 4396
e-mail Pablo.Plasencia@uv.es

PONDRELLI, Monica
International Research School of
Planetary Sciences, Università d'Annunzio
viale Pindaro 42, 65127 Pescara, Italy
Tel. +390854537886
e-mail monica@irsps.unich.it

POOLE, Forrest G. (Barney)
U.S. Geological Survey,
MS-973, Box 25046, Federal Center
Denver, CO 80225-0046, U.S.A.
Tel. 303 236 5599
e-mail bpoole@usgs.gov

PURNELL, Mark
Department of Geology
University of Leicester
University Road
Leicester LE1 7RH, U.K.
Tel. +44 116 252 3645
e-mail map2@le.ac.uk
www.le.ac.uk/gl/map2/

PYLE, Leanne*
Geological Survey of Canada,
9860 West Saanich Road, P.O. Box 6000
Sidney, B.C. V8L 4B2, Canada
Tel. 250 363 6385
e-mail lpyle@nrcan.gc.ca

QI, Yu-ping
Nanjing Institute of Geology & Palaeontology
Chinese Academy of Sciences
39 East Beijing Road, Nanjing,
Jiangsu 210008, P.R. China
Tel. 86 25 83282218
e-mail ypqi@nigpas.ac.cn

RAINE, Rob*
Ichron Limited, Century House
Gadbrook Business Park, Rudheath
Cheshire, U.K. CW9 7TL

e-mail rjr873@bham.ac.uk

RANDON, Carine
Université Pierre et Marie Curie,
UMR 7207 CR2P « Centre de Recherche sur la Paléobiodiversité et les Paléoenvironnements »
4 place Jussieu,Tour 46-56, 5ème étage, C104,
75252 Paris cedex 05, France
Tel. +33 (0)1 44 27 49 13
e-mail carine.randon@upmc.fr

REIMERS, Aleksey N.*
Dept. of Paleontology, Geological Faculty
Moscow State University
119992 Moscow GSP-2, Russia
Tel. 007 095 939 4924/939 1283
e-mail areimers@geol.msu.ru

REPETSKI, John E.
U.S. Geological Survey, MS 926A National Center, Reston, Virginia 20192, U.S.A.
Tel. 703 648 5486
e-mail jrepetski@usgs.gov (o)
jrepetski@cox.net (h)

REXROAD, Carl B.
Indiana Geological Survey
611 N. Walnut Grove
Bloomington, IN 47408, U.S.A.
Tel. 812 855 1350
e-mail crexroad@indiana.edu

RIGO, Manuel
Department of Geosciences
University of Padova
Via Giotto 1, 35137 Padova, Italy
Tel. +39 049 8272092
e-mail manuel.rigo@unipd.it

ROSALES, Carla*
INGEO-Universidad Nacional de San Juan
Cereceto y Meglioli, 5400 San Juan, Argentina
Tel. 54 0264 4251613
e-mail carlavrf@hotmail.com

ROSSCOE, Steven J.*
Hardin-Simmons University
2200 Hickory Street, Box 16164
Abilene, TX 79698, U.S.A.
Tel. (325) 670 1387
e-mail srosscoe@hsutx.edu

RUPPEL, Stephen C.*
University of Texas at Austin
Bureau of Economic Geology
University Station, Box X
Austin, TX 78713-8924, U.S.A.
Tel. 512 471 2965
e-mail Stephen.ruppel@beg.utexas.edu

SALINAS, Jose*
Department of Natural Sciences
University of Houston-Downtown
1 Main Street, Houston, TX 77002, U.S.A.
Tel. 713 221 8168
e-mail josegerardosalinas@yahoo.com

SANDBERG, Charles A.
U.S. Geological Survey
Box 25046, MS 939, Federal Center
Denver, CO 80225-0046, U.S.A.
Tel. 303 236 5763
e-mail sandberg@usgs.gov
conodonts@comcast.net

SANSOM, Ivan J.*
Earth Sciences, University of Birmingham
Birmingham, B15 2TT, U.K.
Tel. 44 121 414 6147
e-mail I.J.Sansom@bham.ac.uk

Sanz-López, Javier
Facultad de Ciencias da Educacion
Universidade da Coruna
Campus de Elvina, s/n E-15071 A Coruna, Spain
Tel. +34 981167000 (ext. 4684)
e-mail jasanz@udc.es

SARMIENTO, Graciela N.
Departamento de Paleontologia
Facultad de Ciencias Geologicas
Universidad Complutense de Madrid
Antonio Novais, 2.28040 Madrid, Spain
Tel. + 34 913944846
e-mail gsarmien@geo.ucm.es

SASHIDA, Katsuo*
Graduate School of Life and Environmental Sciences, University of Tsukuba,
Ibaraki, 305-8572 Japan
Tel. 81 298 553 4303
e-mail sashida@geol.tsukuba.ac.jp

SAVAGE, Norman M.
Department of Geological Sciences
1272 University of Oregon
Eugene, Oregon 97403, U.S.A.
Tel. 1 541 343 4683
e-mail nmsavage@uoregon.edu

SAYDAM-DEMIRAY, Dilek Gulnur*

Maden Tetkik Arama Genel Mudurlugu Jeoloji
Etutleri Dairesi
06520 Balgat/Ankara/Turkey
Tel. 903 122873430 (ext.2496)
e-mail dgsaydam@mta.gov.tr

SCOMAZZON, Ana Karina
Universidade Federal de Pelotas - UFPel
Street, city, postal code etc.:
Rua Dom Pedro II, 912 / 704
Bairro Centro
Pelotas, RS – 96010-300 Brasil
Tel. +55 53 91327952
e-mail akscomazzon@yahoo.com.br

SERPAGLI, Enrico
Dipartimento di Scienze della Terra, Università
di Modena e Reggio Emilia, L.go S. Eufemia 19,
I-41100 Modena, Italy
Tel. +39 059 205 5868
e-mail serpagli@unimore.it

SEVASTOPULO, George D.
Department of Geology, Trinity College
Dublin 2, Ireland
Tel. +353 1 8961361
e-mail gsvstpul@tcd.ie

SHEN, Shuzhong
State Key Laboratory of Palaeobiology and
Stratigraphy, Nanjing Institute of Geology
& Palaeontology
39 East Beijing Road
Nanjing, Jiangsu Province 210008, PRC
Tel. +86 25 83282131
e-mail szshen@nigpas.ac.cn

SIMPSON, Andrew
Department of Environment & Geography,
Macquarie University, NSW 2109, Australia
Tel. (61 2) 985 08183
e-mail andrew.simpson@mq.edu.au

SLAVIK, Ladislav
Institute of Geology AS CR, v.v.i.
Rozvojova 269, CZ-16500 Praha 6,
Czech Republic
Tel. +420 233 087247
e-mail slavik@gli.cas.cz

SLOAN, Terry
Centre for Industry & Innovation Studies
(CInIS), School of Management, College of
Business, University of Western Sydney
Building 11, Campbelltown Campus
Locked bag 1797, Penrith South DC
NSW Australia 1797
or Building 11, University of Western
Sydney, Goldsmith Avenue,
Campbelltown, NSW, Australia 2560
Tel. +61 2 46 203239
e-mail t.sloan@uws.edu.au

SMITH, Paul
School of Geography, Earth & Environmental
Sciences, University of Birmingham,
Edgbaston, Birmingham B15 2TT, U.K.
Tel. +44 121 414 4173
e-mail m.p.smith@bham.ac.uk

SNIGIREVA, Maria*
Institute of Geology and Geochemistry of the
Urals Branch of Russian Academy of Sciences
Pochtovy per., 7, 620000 Ekaterinburg, Russia
e-mail snigireva-mp@yandex.ru or
sveta@igg.uran.ru

SPALLETTA, Claudia
Dipartimento di Scienze della Terra
e Geologico Ambientali,
Alma Mater Studiorum-Università di Bologna
Via Zamboni 67, I-40126 Bologna, Italy
Tel. +39 051 2094578
e-mail claudia.spalletta@unibo.it

SPENCER, Lee A.*
Biology Department, Southern Adventist
University. PO Box 370
Collegedale, TN 37315, U.S.A.
Tel. 423 236 2997
e-mail leespencer@southern.edu

STAMM, Nancy*
USGS National Center MS-926A
12201 Sunrise Valley Drive,
Reston, VA 20192, U.S.A.
Tel. 703 648 4317
e-mail nstamm@usgs.gov

STAMM, Robert*
USGS National Center MS-926A
12201 Sunrise Valley Drive, Reston, VA 20192,
U.S.A. Tel. 703 648 5271
e-mail rstamm@usgs.gov

STRITZKE, Ruediger*
Geologischer Dienst NRW
D-Greiff-Str. 195, D-47803 Krefeld, Germany
Tel. 492151 897263
e-mail ruediger.stritzke@gd.nrw.de

SUDAR, Milan N.

University of Belgrade. Faculty of Mining & Geology, Dept. of Paleontology,
Djušina 7, P.O. Box 62
11000 Belgrade, Serbia
Tel. ++381 11 26 33 297
e-mail sudar@eunet.rs

SUTTNER, Thomas
Commission for the Palaeontological & Stratigraphical Research of Austria, University of Graz, Institute of Earth Sciences (Geology & Palaeontology),
Heinrichstrasse 26, A-8010 Graz, Austria
Tel. ++43 (0)316 380 8735
e-mail Thomas.suttner@uni-graz.at

SWEET, Walter C.
Ohio State University, 3351 Mansion Way
Columbus, Ohio 43221, U.S.A.
Tel. 614 451 3555
e-mail wsweet@columbus.rr.com

SZANIAWSKI, Hubert
Institute of Paleobiology, Polish Academy of Sciences, Twarda 51/55
00-818 Warszawa, Poland
Tel. (48 22) 697 8897
e-mail szaniaw@twarda.pan.pl

TAKAHASHI, Satoshi
Institute of Geology and Paleontology
Tohoku University, 6-3 Aoba, Aramaki
Sendai 980-8578, Japan
Tel. 81-22-795-6625
e-mail stakahashi@m.tains.tohoku.ac.jp
Home Page: http://satcy.ninja-web.net/English_index.html

TALENT, John A.
Earth & Planetary Sciences, Macquarie University, NSW 2109, Australia
Tel. (61 2) 9850 8336
e-mail jatalent@yahoo.com

TARABUKIN, V.P.*
Institute of Geology Diamond & Precious Metal
Russian Academy of Science, Siberian Branch
Lenin av. 39, Yakutsk 677891, Russia
Tel. (4112) 33 58 11
e-mail v.p.tarabukin@diamond.ysn.ru

TROTTER, Julie A.*
Research School of Earth Sciences
The Australian National University
Mills Road, Canberra, ACT 0200
Tel. +61 2 6125 9968
e-mail Julie.trotter@anu.edu.au

UYENO, Tom
Geological Survey of Canada
3303-33rd Street NW
Calgary, AB T2L 2A7, Canada
Tel. 403 292 7084
e-mail tuyeno@nrcan.gc.ca

VALENZUELA-RÍOS, José*
Department of Geology
University of Valencia
c/Dr. Moliner 50, E-46100 Burjasot, Spain
Tel. +349 63543412
e-mail Jose.I.Valenzuela@uv.es

VIIRA, Viive
Institute of Geology at Tallinn University of Technology. Ehitajate tee 5, 19086 Tallinn, Estonia
Tel. 372 620 3035
e-mail viira@gi.ee

von BITTER, Peter H.
Royal Ontario Museum, Palaeobiology Division, Dept. of Natural History,
100 Queen's Park
Toronto M5S 2C6, Canada
Tel. 416 586 5592
e-mail peterv@rom.on.ca

WANG, Cheng-yuan
Nanjing Institute of Geology & Palaeontology
Chinese Academy of Sciences
E. Beijing Road 39, Nanjing 210008, PRC
Tel. 025 83282236 (o)
025 57714223 (h)
e-mail cywang@nigpas.ac.cn

WANKIEWICZ, Aleksandra
Warsaw University, Faculty of Geology
ul. Zwirki i Wigury 93
02-089 Warsaw, Poland
Tel. 48 225 540488
e-mail a.wankiewicz@uw.edu.pl

WARDLAW Bruce R.
U.S. Geological Survey and University of Texas at Arlington
National Center, 12201 Sunrise Valley Drive,
Reston, VA 20192-0001 USA
Tel. 1-703-648-5288
e-mail bwardlaw@usgs.gov

WEDDIGE, Karsten*

Forschungsinstitut und Naturmuseum
Senckenberg
Senckenberganlage 25
Frankfurt am Main D-60325, Germany
Tel. 49 69 97075141
e-mail karsten.weddige@senckenberg.de

WHEELEY, James R.
School of Geography, Earth and Environmental Sciences, University of Birmingham, Edgbaston, Birmingham B15 2TT, UK
Tel. +44 (0)121 41 46158
e-mail j.r.wheeley@bham.ac.uk

WHITESIDE, Joe*
Chesapeake Energy Corp.
6100 N. Western Avenue, Oklahoma City, OK 73154, U.S.A.
Tel. 405 935 4806
e-mail joe.whiteside@chk.com

WICKSTRÖM, Linda M.*
Geological Survey of Sweden
Box 670, 75128 Uppsala, Sweden
Tel. 0046 18 179313
e-mail linda.wickstrom@sgu.se

WITZKE, Brian J.*
Iowa Geological & Water Survey
109 Trowbridge Hall
Iowa City, Iowa 52242-1319, U.S.A.
Tel. 319 335 1590
e-mail Brian.Witzke@dnr.iowa.gov

WORONCOWA-MARCINOWSKA, Tatiana
Polish Geological Institute-
National Reseach Institute,
4 Rakowiecka St.,
00-975 Warszawa, Poland
Tel. 48 22 849 53 51 (ext. 282)
e-mail tatiana.woroncowa-marcinowska@pgi.gov.pl.

WU, Rongchang*
Nanjing Institute of Geology & Palaeontology
Chinese Academy of Sciences
39 East Beijing Road, Nanjing 210008,
P.R. China
e-mail wu.rongchang@gmail.com

YAO, Jianxin
Institute of Geology,
Chinese Academy of Geological Sciences
26 Baiwanzhuang Road
Beijing 100037, China
Tel. 86 10 68999706
e-mail yaojianxin@cags.ac.cn

YOSHIDA, Takashi
Enokigaoka 43-3, Aobaku
Yohohama, 227-0063 Japan
Tel. 045 983 8936
e-mail syoshi@rd6.so-net.ne.jp

ZHANG, Huaqiao
School of Earth & Space Science
Peking University
Beijing 100871, P.R. China
Tel. 86 10 15011 341521
e-mail zhang-huaqiao@foxmail.com

ZHANG, Shunxin
Canada-Nunavut Geoscience Office
P.O. Box 2319, Iqaluit
Nunavut, X0A OHO Canada
Tel. (867) 975 4579
e-mail shzhang@NRCan.gc.ca

ZHEN, Yong Yi
The Australian Museum
6 College St., Sydney,
NSW 2010, Australia
Tel. 61 2 93206132
e-mail yongyi.zhen@austmus.gov.au

ZHURAVLEV, Andrey V.
VNIGRI, Liteiny pr. 39,
St. Petersburg, Russia
e-mail stratigr@mail.wplus.net
or avz_65@mail.ru