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URL: <http://seis.natsci.csulb.edu/ISOS>

Cover: The logo of the 9th *International Symposium on the Ordovician System* held in Argentina, 2003; Felix Gradstein and Stan Finney at the Global Stratotype Section and Point for the base of the Upper Ordovician Series at Fågelsång, Scania, Sweden; and the signboard of the GSSP.

NOTE FOR CONTRIBUTORS

The continued health and survival of *Ordovician News* depends on YOU to send in items of Ordovician interest such as lists and reviews of recent publications, brief summaries of current research, notices of relevant local, national and international meetings, etc. As more geological software becomes available, details of this would also be welcomed by many of us. Also please ensure the SOS's Secretary (responsible editor) is notified of any changes in address, telephone or fax number and e-mail address.

EDITOR'S NOTE

Welcome to the new issue of *Ordovician News* in hard and soft versions, the fifth one since I am serving as editor. Current number (20, 2003) is assembled as webpage for easier downloading of required information from the page of contents. Even though we are still mailing a few hard copies; in particular, for those Ordovician friends who are not able to get into the network. Our previous electronic distributions were very successful, particularly by dramatically diminishing costs of printing and postage, as well as by allowing us to have the newsletter in the personal computer for permanent and easy access. In case members of the Ordovician community have any comment on this issue, the secretary would be pleased to hear from them. I would like to thank you all for the many contributions for the current number.

Present issue was assembled just after the 9th *International Symposium on the Ordovician System, 7th International Graptolite Conference & 2003 Field Meeting of the Subcommission on Silurian Stratigraphy* was held in Argentina, in August 2003. As member of the Organizing Committee the time consuming preparation of these events, represented a delay on delivery of present issue. Many of us had the opportunity to meet at the venue, San Juan City, where I think we spent enjoyable times sharing our common interests on most updated Ordovician geology. Remember to visit the web site of INSUGEO (CONICET – Universidad Nacional de Tucumán, Argentina) to download the proceedings and field trip guides of the events (<http://www.unt.edu.ar/fcsnat/INSUGEO>). On behalf of the organizing committee I wish to thank you all who had the opportunity to participate in 9th ISOS, and contributed hallmark pieces of work.

Several other important international meetings and field trips, particularly related to Ordovician stratigraphy and paleontology, are included. Recent advances on proposed stratotypes, and names for the global Ordovician subdivisions, are documented. Also you will find information on several new international projects, scientific reports and honorary notes. And, as always, your personal contributions on current research, publications, and updated addresses.

I am particularly grateful for the technical support provided by John Francis (California State University, Long Beach, USA), who uploaded current issue of *Ordovician News* in its internet web site.

I appreciate very much your confidence in my service to the secretariat of the Subcommission.

GUILLERMO L. ALBANESI

CHAIRMAN'S AND SECRETARY'S ADDRESSES

STANLEY C. FINNEY
Dept. of Geological Sciences
California State University - Long Beach
Long Beach, CA 90840
U.S.A.
Tel: +1 (562) 985-8637
Fax: +1 (562) 985-8638
E-mail: scfinney@csulb.edu

GUILLERMO L. ALBANESI
CONICET – Museo de Paleontología
Universidad Nacional de Córdoba
C. C. 1598, 5000 Córdoba
ARGENTINA
Tel: +54 (351) 471-8655
Fax: +54 (351) 421-6350
E-mail: 1) galbanesi@arnet.com.ar,
2) galbanesi@com.uncor.edu

CHAIRMAN'S REPORT

The 9th International Symposium on the Ordovician System held San Juan, Argentina, in August was the highlight of 2003. I congratulate the many members of the organizing committee, in particular Chair Gilberto Aceñolaza and co-chairs Guillermo Albanesi and Silvio Peralta, for their outstanding efforts and contributions in producing a most successful and exciting meeting. The technical sessions were well attended and well run. Both pre- and post-symposium excursions were fully subscribed and provided outstanding opportunities to examine Ordovician stratigraphic successions in the Precordillera and Cordillera Oriental. In addition, a wonderful set of publications including the proceedings volume *Ordovician from the Andes* was distributed at the meeting and are available on line (<http://www.unt.edu.ar/fcsnat/insugeo/>) along with other special publications, such as field trip guides and the book *Aspects of the Ordovician System in Argentina*. And, of course, Ordovician workers from throughout the world were able not only to know the Ordovician geology of Argentina but also to develop stronger friendships with Argentine colleagues, to experience the fine wines and cuisine (asado and empanadas in the field) of Argentine, and to witness the sensuality of tango. The success of the San Juan meeting was also due to the diverse audience generated by the fact that 9th ISOS was run jointly with the 7th International Graptolite Conference and a Field Meeting of the Subcommittee on Silurian Stratigraphy, which were organized in large part by Gladys Ortega and Guillermo Aceñolaza with assistance from many colleagues.

Besides the presentation of new research results at the symposium, the Ordovician Subcommittee made important progress in its primary mission of selection of GSSPs to finish subdivision of the Ordovician System. Three candidate GSSP proposals are under consideration for the base of the Middle Ordovician System: 1) the FAD of the graptolite *Isograptus v. victoriae* in sections in western Newfoundland, 2) the FAD of the conodont *Baltoniodus triangularis* in the Huanghuachang section in China, and 3) the FAD of the conodont *Protoprioniodus aranda* in the Niquivil section in Argentina. These were discussed at length, and the Niquivil section was visited in the pre-symposium field excursion. More work must be done on these proposals, but I hope that the Subcommittee can select a GSSP by August 2004 when my term as Chair and the terms of many long-standing members of the Subcommittee end. Selection of a GSSP for a boundary that divides the Upper Ordovician Series into two stages has been difficult because candidate stratotype sections have not

been found for the biohorizons under consideration (FAD of the graptolite *Dicellograptus complanatus* or of the conodont *Amorphognathus ordovicianus*). At San Juan, the decision was made to abandon these biohorizons and, instead, to consider subdivision of the Upper Ordovician Series into three stages. In this scheme, the lower stage of the Upper Ordovician Series would encompass the graptolite zones of *N. gracilis* and *C. bicornis*. The middle stage with its lower boundary defined on the FAD of the graptolite *D. caudatus* would include the equivalents of the graptolite zones of *clingani*, *linearis*, *complanatus*, and *pacificus*. The upper stage of the Upper Ordovician Series would be the Hirnantian Stage with its based defined as the base of the *N. extraordinarius* graptolite zone. The voting members of the Subcommittee unanimously supported this new approach for subdivision of the Upper Ordovician Series. It is expected that GSSP proposals for the two boundaries will be in hand in early 2004. The voting members of the Subcommittee nominated new officers and voting members with formal selection to take place soon by mail ballot. Finally, the Subcommittee voted to hold the 10th ISOS in Nanjing, China in 2007, where it will be hosted by Nanjing Institute of Geology and Palaeontology.

In May 2003, the Fågelsång and Diabasbrottet GSSPs were dedicated in Sweden, as reported elsewhere in this issue. With the primary mission of the Subcommittee, i.e. to subdivide the Ordovician System into precisely defined global Stages, nearing completion, what is raised is: What then will be the future of the Ordovician Subcommittee? Perhaps, we should look to the future of the International Commission on Stratigraphy for guidance.

The ICS has set a goal of completing definition of all global Stages of the Phanerozoic with selection of GSSPs by 2008. Presently, approximately 50 of the 100 potential GSSPs have been approved and ratified, and most Subcommittees are making rapid progress towards completion. Accordingly, an innovative meeting of the International Commission on Stratigraphy was held in Urbino, Italy in June 2002, as reported in *Ordovician News No. 19*. The meeting brought together most Subcommittee chairs and the ICS executive with the purpose of revitalizing ICS and setting a new mission, one that would build on the accomplishment of establishing a global chronostratigraphic time scale. That mission may prove to be high-resolution global change as recorded by dynamic stratigraphy. For the Ordovician Subcommittee, it may be expressed in the Global Ordovician Earth Systems (GOES) program, which I have been promoting for the last few years. The aim of this program is to bring geological phenomena represented in Ordovician stratigraphy to the attention of multidisciplinary teams of specialists that will

investigate these phenomena with an integrated Earth Systems approach. The Late Ordovician mass extinction is a perfect example. Many Ordovician specialists have investigated, often independently and within local regions, the biostratigraphies of various fossil groups, the chemostratigraphy, and the sedimentology and sequence stratigraphy in sections through the "Hirnantian" interval and others have examined global climate modeling. With high-resolution global chronostratigraphy, it is now possible to integrate many varied datasets from stratigraphic successions worldwide in order to fully examine the timing and effects of intense, rapid global climate change on the oceans, atmosphere, and biosphere. Similar integrated, global studies can be made of other phenomena recorded in Ordovician stratigraphy, e.g. eustasy, orogenesis and continental dynamics, and greenhouse events, to name a few.

To further promote the GOES program, the Subcommittee on Ordovician Stratigraphy is sponsoring, and Chris Barnes, Bill Berry, and I are convening, a symposium on the GOES program at the 32nd International Geological Congress in Florence in August 2004. I encourage members of the Ordovician community to participate in this symposium. I encourage Ordovician colleagues of diverse disciplines to bring their skills together to investigate Ordovician phenomena at the global scale and to present these investigations in Florence. So far, the GOES program has been realized only with regard to the Late Ordovician extinction and associated climate change. It is time to increase its scope to other Ordovician phenomena and events. The Geological Society of America has expressed an interest and is considering a Special Publication with papers arising from the symposium, thus providing a wonderful opportunity to showcase Ordovician stratigraphy and research on the Ordovician System. If you are interested in contributing, please contact me or one of the other conveners and submit an abstract by 10 January 2004.

Since it was founded in 1974, much of the energy of the Ordovician Subcommittee and much of the attention of the International Symposia on the Ordovician System have been devoted to chronostratigraphy and selection of GSSPs. Now this is changing. A new mission must and will emerge, and with it there must be an evolution of the membership, in particular in the composition of the voting members, who should be the leaders of the Subcommittee. In the past, there was a need for the voting members to be biostratigraphers with extensive experience on and knowledge of stratigraphic successions worldwide. The new mission requires a greater diversity of specialists, yes still biostratigraphers, but also paleobiologists, litho- and sequence-stratigraphers, geochemists, climate modelers, paleoceanographers, and much more. In

addition, young scientists are needed to replace older voting members who wish to retire. Revitalization of the Ordovician Subcommittee means not only a new mission but also new members. Thus, I call on all voting (titular) members to recruit and promote new voting members, but I also encourage all who wish to participate to make their wishes known to the voting members and executive.

Before closing, I wish to make two announcements with regard to the International Commission on Stratigraphy on matters that developed out of the Urbino meeting and with which I have been involved as a vice-chair of ICS. First, the ICS has established a publication arrangement with *Lethaia*. That journal is now the official publication outlet of ICS. It is not the exclusive publication outlet and it will take time to fully develop. If successful, the relationship will produce a financial return for ICS and its Subcommittees and greater visibility for many of their products, and it will greatly broaden the scope and audience of *Lethaia*. I encourage you to direct your stratigraphic papers to *Lethaia* and to contact me if you are considering doing so in order that they be properly identified as ICS products. In addition, the ICS has established two stratigraphic prizes that will be awarded every four years at the International Geological Congress. These are the Digby McLaren Medal and the ICS Medal. The former will be awarded to honor a significant body of internationally important contributions to stratigraphy sustained over many years; the latter will honor high quality research in Stratigraphy by recognizing a singular major achievement in advancing stratigraphical knowledge. As a member of the ICS awards committee, I will be accepting nominations that you may wish to make. Further details will soon be available on the ICS website (<http://www.micropress.org/stratigraphy/>).

STAN FINNEY

SOS ANNUAL REPORT FOR 2002

1. Name of constituent body:

Subcommittee on Ordovician Stratigraphy (SOS)

2. Overall objectives, and Fit within IUGS science policy:

The Subcommittee promotes international cooperation in Ordovician Stratigraphy. Specific objectives are:

a. To delimit and subdivide the Ordovician System (and Period) as a part of the overall ICS mission to elaborate the standard global stratigraphic scale. This work aims to establish the boundaries (GSSPs), the

correlation of the subdivisions (Stages and Series), and the nomenclature of the subdivisions.

b. To promote regular international meetings on aspects of Ordovician geology, especially those devoted to clarifying stratigraphic procedures, nomenclature and methods for use in establishing a unified global time scale, and to prepare correlation charts with explanatory notes (this latter task now completed).

c. To encourage, promote, and support research on all aspects of Ordovician geology worldwide and to provide outlets, *Ordovician News*, international meetings, and a web page, for promoting discussions and reporting results of this research.

d. To encourage, promote, and support interdisciplinary research on the Ordovician global Earth system, addressing topics that require high-resolution, global correlation.

The ultimate goal of the Subcommittee is to provide a high-resolution geological time scale that will be a critical foundation for interdisciplinary research on the global Earth system during the Ordovician Period. The work is broad based and must include specialists in paleontology, all subdisciplines of stratigraphy (bio-, litho-, chemo-, and magneto-), sedimentology, geochemistry, and tectonics. With active participants from more than 25 countries, the Subcommittee involves much of the global geological community.

3. Summary table of Ordovician subdivisions

SYSTEM	GLOBAL SERIES	GLOBAL STAGES	KEY GRAPTOLITE/ CONDDONT (C) BIOHORIZONS
ORDOVICIAN	UPPER	---	← <i>P. acuminatus</i> (GSSP - Dob's Linn) ← <i>D. complanatus</i> , or ← <i>A. ordovicicus</i> (c)
	MIDDLE	DARRWILIAN	← <i>N. gracilis</i> (GSSP - Fagelsang) ← <i>U. aurodentatus</i> (GSSP - Huangnitang)
	LOWER	TREMADOCIAN	← <i>T. laevis</i> (c), or ← <i>B. triangularis</i> (c), or ← <i>P. aranda</i> (c), or <i>I. v. lunatus</i> ← <i>T. approximatus</i> (GSSP - Diabasbrottet) ← <i>I. fluctivagus</i> (c) (GSSP - Green Point)

4. Organization:

- a. Subcommittee Executive Chairperson, S.C. Finney (U.S.A.)
- Vice-chairperson, Chen Xu (P.R. China)
- Secretary, G.L. Albanesi (Argentina)
- 17 other Voting Members
- 92 Corresponding Members

- b. GOES Program - research committee
- Secretary, W.B.N. Berry (U.S.A.)
- 4 other members

5. Extent of national/regional/global support from sources other than IUGS:

SOS receives no formal support from international organizations outside IUGS/ICS. The activities of some Subcommittee members (voting and corresponding) have been supported in part by IGCP 410. Independent support for projects comes mainly from individual Ordovician workers, through their employer organizations and through individual to multidisciplinary, cooperative, team activities supported by grants from national/regional government-funded bodies.

6. Interface with other international projects:

The membership of the Subcommittee both geographically and in terms of research interests effectively reflects available expertise in aspects of Ordovician stratigraphy.

The Subcommittee has no formal links with other global projects, though some individual Ordovician workers are members of IGCP projects, most notably the following:

- Project 386: Response of the Ocean/ Atmosphere System to Past Global Changes
- Project 410: The Great Ordovician Biodiversification Event

7 & 9. Chief accomplishments and Products in 2002:

- a. The GSSP for the base of the Second Stage, yet to be named, for the Ordovician System (upper stage of Lower Ordovician Series) - the base of the *Tetragraptus approximatus* graptolite Zone in the Diabasbrottet section in southern Sweden - was approved by the International Commission on Stratigraphy and ratified by the IUGS executive.
- b. the GSSP for the base of the Upper Ordovician Series and the Third Stage (lower stage of Upper Ordovician Series, yet to be named) - the base of the *Nemagraptus gracilis* graptolite Zone in the Fågelsång section in Sweden - was approved by the International Commission on Stratigraphy and ratified by the IUGS executive.

c. With the help of the Ordovician Stratigraphy Discussion Group website (<http://seis.natsci.csulb.edu/ordstrat2/default.htm>) discussion continued on the GSSP for the base of the Middle Ordovician Series. The web site proved invaluable in facilitating discussion and making important progress. Two GSSP proposals have been received - the FAD of the conodont *Protoprioniodus aranda* in the Niquivil section in Argentina, and the FAD of the conodont *Baltoniodus triangularis* in the Huanghuachang section, China. Study of large, diverse conodont collections from the Ibex section in Utah, USA, indicate that the Ibex section is a potential stratotype where the base of the Middle Ordovician Series can be defined on both conodonts and trilobites. New studies of graptolite, conodont, and trilobites faunas in sections in western Newfoundland may prove fruitful in the search for a GSSP, and additional work is being carried out on the Niquivil section.

d. A general interest Friends of the Ordovician meeting was attended by 20 participants of the Annual Meeting of the Geological Society of America, Denver, Colorado, November, 2002.

e. *Ordovician News No. 19* was published and distributed electronically in June 2002.

8. Chief problems encountered in 2002:

The lack of travel support limited the participation of Voting Members from outside North America in Subcommittee activities at the Annual Meeting of the Geological Society of America and will limit the number of Voting Members who can participate in future field meetings to evaluate potential stratotype sections.

11-14. Work Plan, Critical Milestones, and Anticipated Results for Next Year:

a. *Ordovician News*, No. 20, assembled by G.L. Albanesi, will be published in the Spring 2003 and posted on the Subcommittee's website.

b. The 9th International Symposium on the Ordovician System will be held in San Juan, Argentina, 18-21 August 2003. It will be held jointly with the 7th International Graptolite Conference, and a Field Meeting of the Subcommittee on Silurian Stratigraphy. This meeting will include pre- and post-meeting field excursions to the Argentine Precordillera and the Cordillera Oriental, as well as other short excursions. The Niquivil section (a candidate GSSP - base of Middle Ordovician Series) will be visited and evaluated. Business Meetings will be devoted to 1) extensive discussion and evaluation of candidate sections and biohorizons for the two GSSPs still to be determined, 2) selection of new Voting members and

retirements among existing membership, 3) the future mission of the Ordovician Subcommittee, once all GSSPs have been selected, 4) the activities of the Ordovician Subcommittee at the 32nd IGC, in particular the symposium session "Global Ordovician Earth System," and 5) selection of the site and organizers of the 10th ISOS scheduled for 2007.

c. A goal is to select GSSPs for base of Middle Ordovician Series and for base of upper stage of Upper Ordovician Series, and then to formally name all unnamed stages. Whether this can be attained in 2003 is unknown; however, this will remain the primary focus of the Subcommittee until it is completed.

d. Article on Diabasbrottet GSSP will be submitted to *Episodes*, with a note that Fågelsång GSSP was published earlier in *Episodes*.

e. Dedication ceremonies for the Diabasbrottet and Fågelsång GSSPs in Spring 2003.

17. Chief accomplishments/results over the last 5 years (1998-2002):

a. Approval, ratification, and dedication of the Green Point GSSP for the base of the Ordovician System.

b. Approval, ratification, and dedication of the Huangnitang GSSP for the base of the Darriwilian Stage (upper stage of Middle Ordovician Series).

c. Approval and ratification of the Diabasbrottet and Fågelsång GSSPs for the bases of the upper stage of the Lower Ordovician Series and the Upper Ordovician Series, respectively.

d. Significant progress on definition of series and stages for the Ordovician System with only two GSSPs remaining to be selected and approved by the Subcommittee.

e. With publication in 2000 of *A Revised Correlation of Ordovician Rocks in the British Isles*, correlation charts have been completed for Ordovician rocks on all continents.

f. 8th International Symposium on the Ordovician System in Prague, Czech Republic in July 1999, and publication of a 543 page proceedings volume (*Acta Universitatis Carolinae, Geologica*, v. 43, no. 1/2). 147 participants represented 21 countries; 142 papers were presented in technical sessions.

g. Organization of the 9th International Symposium on the Ordovician System in San Juan, Argentina, scheduled for August 2003, in conjunction with the 7th International Graptolite Conference and a Field Meeting of the Subcommittee on Silurian Stratigraphy.

h. Publication of *Ordovician News* nos. 15-19 and the posting of nos. 16-19 on the Subcommittee's web site.

i. Development of the web site "Ordovician Stratigraphy Discussion Group" to facilitate discussions on selection of the GSSP for the base of the Middle Ordovician Series.

j. Sponsorship of a technical session and field excursion on the GSSP for the base of the Middle Ordovician Series at the Annual Meeting of the Geological Society of America in November 2000.

k. Sponsorship at the 31st International Geological Congress of the symposium "Paleontological, stratigraphical, and paleogeographical relations among South America, Laurentia, Avalonia, and Baltica during the Ordovician."

l. Launched GOES (Global Ordovician Earth System) Program to stimulate integrated multi-disciplinary studies of global events (mass extinction, sea-level changes, greenhouse conditions, tectonics) during the Ordovician Period.

m. Sponsorship of special symposium on the Ordovician System at the Geological Society of America Annual Meeting in 2000, of WOGOGOB 2001 in Copenhagen, and of the meeting and field excursion "The Gondwanan Platform in Ordovician times: Climatic, eustatic and geodynamic evolution", in Morocco in February 2001.

18. Anticipated objectives and work plans for the next 5 years (2003-2008):

a. Approval and ratification of GSSPs remaining to complete subdivision of Ordovician System with goal of completion and dedication by 2004.

b. 9th International Symposium on Ordovician System to be held in Argentina in August 2003.

c. Sponsorship of "Global Ordovician Earth Systems" symposium at 32nd International Geological Congress in 2004.

d. Redirection of Subcommittee's focus to interdisciplinary investigation of the global Ordovician Earth system.

INTERNATIONAL SYMPOSIA, CONFERENCES AND FIELD MEETINGS

DEDICATION OF FÅGELSÅNG AND DIABASBROTTET GSSPS

Two GSSPs (Global Standard Stratotype Section and Point) for the Ordovician System were dedicated in Sweden on 25 & 26 May 2003. The ceremonies were well organized and well attended and included not only the unveiling of formal plaques describing the GSSPs but also the driving of "golden spikes".

The first ceremony on 25 May was at Fagelsang near Lund in Scania, southern Sweden. The FAD of the graptolite *Nemagraptus gracilis* in the Fagelsang section defines the base of the Upper Ordovician Series and the base of its lower stage, yet to be named. More than 40 people attended including large groups from Lund and Copenhagen, the full executive committee of the International Commission on Stratigraphy, and Ordovician colleagues from Stockholm and Uppsala and from Norway, Russia, Estonia, Poland, Spain, Germany, and the United States. The local morning newspapers featured front page stories on the Fagelsang GSSP. Following an opening statement by Stan Finney on the importance of GSSPs in defining global units of the Geologic Time Scale, the GSSP plaque was unveiled. Next, participants took turns hammering a "golden spike" into the section at the level of the FAD of *N. gracilis*. A champagne toast followed as Felix Gradstein, Chair of ICS, spoke of the excellent work of the Ordovician Subcommittee, and Stig Bergström described the history of studies in the Fagelsang area and the detailed litho- and biostratigraphy of the stratotype section. After several days of heavy rain in Scandinavia, sunshine, bird songs, and the camaraderie of good friends made the occasion especially pleasant and memorable. Afterwards most participants took lunch at the Dalby Gästgiveri, and then a good number of them drove (5 hours) north to spend the night at Bjertorp slott in Västergötland, south-central Sweden.

The Diabasbrottet GSSP defining the base of the upper Stage, yet to be named, of the Lower Ordovician Series (and the top of the Tremadocian Stage) at the FAD of the graptolite *Tetragraptus approximatus* in the section at Diabasbrottet, Västergötland was dedicated on the morning of 26 May. The ceremony was similar to that at Fagelsang: welcome and words by Stan Finney, unveiling of the plaque, hammering of the golden spike, toasting with champagne, comments by Felix Gradstein and informative presentations by Stig Bergström and Bernie Erdtmann. Lunch was at Kinnekulle, after which participants visited the Oesterplana Quarry to see fossil meteorites in Ordovician orthoceratite limestone.

The dedication ceremonies were especially pleasing to those who had carried out important research on the stratotype sections and were also able to attend and help hammer in the spikes. They were occasions for renewing friendships, celebrating the geology, and toasting important accomplishments of the Ordovician Subcommittee. The Swedish Ordovician Global Stratotype Committee, composed of Kent Larsson, Stig Bergström, Per Ahlberg, and Mats Eriksson, is commended for their outstanding preparations and organization.

STAN FINNEY

MEETING ON EARLY VERTEBRATES

Our next International Meeting on Early/Lower Vertebrates will be held on May 2004 in Gramado, Brasil [2004, not 2003 as announced on our Web page]; the Gross Symposium II will be held in Riga, Latvia, on September 2003 [not yet on the Web].

For more info on early vertebrates, go to: <http://gause.biology.ualberta.ca/wilson.hp/Paleozoic.html>, or e-mail me.

ALAIN BLIECK

BALTIC STRATIGRAPHIC ASSOCIATION
6TH BALTIC STRATIGRAPHIC CONFERENCE
ST. PETERSBURG, RUSSIA, AUGUST 22-26, 2005

The 6th Baltic Stratigraphic Conference will be held in St. Petersburg, August 22-26, 2005 at the All-Russian Geological Research Institute (VSEGEI) and St. Petersburg State University. The proposed meeting will be dealing with aspects of stratigraphy in the Baltic Region and adjacent territories. All interested colleagues are cordially invited to attend the 6th Baltic Stratigraphic Conference. The scientific sessions are planned for August 22-26. The suggested pre- and post-conference field trips are the following:

- to the Cambrian – Ordovician of Leningrad District;
- to the Devonian of Leningrad, Pskov and Novgorod District;
- to the Carboniferous of Leningrad and Novgorod District;
- to the Quaternary of Leningrad District.

If the field trips take place the terms of meeting will be prolonged.

The participants are invited to submit abstracts of both oral and poster presentations; the instruction will be sent in the first circular.

Organizing committee

Conference Chairman: Dr. Tatyana Koren' (VSEGEI)
Vice-Chairmen: Dr. Oleg Petrov (VSEGEI), Dr. Igor Buldakov (St Petersburg University)
Secretary: Dr. Andrey Zhuravlev (VSEGEI)
Members: Dr. Andrey Dronov (St Petersburg University), Irina Evdokimova (VSEGEI), Dr. Alexander Ivanov (St Petersburg University), Dr. Olga Kossovaya (VSEGEI), Dr. Yuri Savitsky (St Petersburg University), Dr. Tatyana Tolmacheva (VSEGEI)

Please, fill in and return the pre-registration form by e-mail not later than January 10th, 2004.

Please send correspondence to:

Dr. Andrey Zhuravlev
All-Russian Geological Research Institute (VSEGEI)
74, Sredniy Pr., St Petersburg, 199106
Russia
E-mail: stratigr@mail.webplus.net
Tel.: +07 812 328 92 10

Dr. Alexander Ivanov
Department of Palaeontology
St. Petersburg University
16 Liniya 29, St. Petersburg 199178
Russia
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BALTIC STRATIGRAPHIC ASSOCIATION
6th Baltic Stratigraphical Conference
St. Petersburg, Russia, August 22-26 , 2005

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PROJECTS

IGCP PROJECT No.410 The Great Ordovician Biodiversification Event Progress Report for 2002

Project Leaders:

1. Barry D. WEBBY

Centre for Ecostratigraphy and Palaeobiology,
Department of Earth and Planetary Sciences, Macquarie
University, North Ryde, NSW, 2109

Email: bwebby@laurel.ocs.mq.edu.au

2. Florentin PARIS

UPR du CNRS "Géoscineces", Université de Rennes I,
35042 Rennes-cedex, France; fax: Int. code + 33 (2) 23
23 61 00; e-mail: florentin.paris@univ-rennes1.fr

3. Mary DROSER

Department of Earth Sciences, University of California,
Riverside, CA 92521, USA; fax: Int. code + 1 (909) 787
4324; e-mail: mary.droser@ucr.edu

Participants in IGCP Project no. 410 have virtually completed their work program after some six years (1997-2002) of active team-work. An extension of one year was requested, and granted, in order to complete the global syntheses of Ordovician biodiversity for publication, and to allow a final meeting to be held in conjunction with the first International Palaeontological Congress (IPC) at Macquarie University (Sydney) during July 2002.

The one-day IGCP 410 meeting held on Monday July 8, 2002, included a very successful session entitled: **"The Response of the Marine Biosphere to Major Changes within the Earth System during the Ordovician"**, organized by Chris R. Barnes (Canada), Barry Webby and Ian Percival (Australia). The meeting was attended by 40 people from 15 different countries. The 12 papers ranged widely from a keynote talk presented by Chris Barnes, entitled **"Ordovician Earth Systems: Physical, Chemical and Tectonic Controls for the Marine Biota"**, to a variety of regional (Australian, Czech, Russian and Mongolian) and global (chitinozoan, echinoderm, and conodont) presentations on Ordovician biodiversity. The session also included a short business meeting that concluded with a final vote of thanks to the Project Leaders for the success of this IGCP project from Sue Turner, Scientific Board Member of IGCP. We were especially gratified to receive an evaluation of Excellent (Plus) from the IGCP Board this year. No funding support was requested as we had US\$800 of carry over funds remaining from 2001. This was mainly expended in support of Ordovician workers from China and Argentina who attended the IPC meeting.

The second significant part of our IGCP 410 tasks for 2002 was the near completion of work of compiling the book entitled **"The Great Ordovician Biodiversification Event"**. The assembled 35 chapters of the volume – contributed by 96 authors from 17 different countries – were submitted to the publishers, Columbia University Press in New York, during the early part of 2003. We now expect the book to be published in early March 2004 (see publicity "flyer" printed elsewhere in this issue of **Ordovician News**). The volume, edited by Barry Webby, Florentin Paris, Mary Droser, and Ian Percival primarily focusses on the majority of significant Ordovician fossil groups – tracking their major biodiversity patterns at both species and genus levels. These patterns provide new insights as to how this greatest, rapidly sustained, diversification of marine life took place on earth. Background material on the Ordovician timescale and the Ordovician world has also been included – some ten introductory chapters focusing on topics such as a new, highly resolved and calibrated Ordovician time scale, a section on the diversity measures used in the volume, a more refined sea level curve that shows close ties between the records in Baltoscandia and Laurentia, as well as outlines of global Ordovician climate, oceanography, isotope signatures, terranes, a possible Middle Ordovician superplume event and the end-Ordovician glaciation. We regard this contribution as the highlight of our six years of IGCP 410 work, and look forward to its publication so that all members of the scientific community can have access to this first major book devoted specifically to establishing the global patterns of diversification of Ordovician biotas through time and space.

We hope that all the Ordovician scientists who have so enthusiastically supported us in our global IGCP 410 biodiversity work between 1997 and 2002 will give continuing strong support to proposers Thomas Servais, Dave Harper Jun Li, Alex Munnecke, Alan Owen and Peter Sheehan in their efforts to establish the successor IGCP project they have entitled **"Impact of changing palaeogeography and palaeoclimate on major biotic changes through the Ordovician"**. We heartily endorse their proposal, and trust that the IGCP Board will establish the project, and provide continuing support over the next five years (2004-2008).

BARRY WEBBY

IGCP PROJECT PROPOSAL

Ordovician Climate

The impact of palaeogeography and global sea-level changes on Early Palaeozoic life

(Stratigraphy, sedimentology, palaeontology, fossil fuels)

To be proposed in October 2003 by

Thomas Servais (Université des Sciences et Technologies de Lille, France)

David Harper (Geological Museum, University of Copenhagen, Denmark)

Jun Li (Nanjing Institute of Geology and Palaeontology, Academia Sinica, China)

Axel Munnecke (Universität Erlangen, Germany)

Alan Owen (University of Glasgow, UK)

Peter Sheehan (Milwaukee Public Museum, WI, USA)

Duration: 2004-2008

Short outline:

The results of the very successful IGCP project n° 410 “The Great Ordovician Biodiversification Event” not only included the development of an improved globally-integrated biozonation for graptolites, conodonts and chitinozoans, but also generated biodiversity curves that have been constructed for all Ordovician fossil groups.

Numerous questions arise from these results, for example how have changing palaeogeography affected biodiversifications observed during the Ordovician, the extinction at the end of the period, and the ongoing radiation in the Silurian. What was the influence of the climate on the major biotic changes through the Ordovician and Silurian? Following the work of the numerous regional teams and of the clade teams, that were established for each fossil group in the IGCP project n° 410, we plan to propose a new successor project in order to attempt to answer some of these questions (and generate others), and develop a better understanding of global sea-level changes during the Early Palaeozoic.

Main annual meetings:

2004: Universität Erlangen, Germany: Opening Meeting: EARLY PALAEOZOIC CLIMATE: INSIGHTS FROM GEOCHEMICAL DATA. Geological excursion to the Lower Ordovician of Öland and the Silurian of Gotland (Sweden)

2005: Milwaukee Public Museum, United States: ECOLOGICAL EVOLUTION IN THE EARLY PALAEOZOIC. Geological excursion to Ordovician of the mid-Continent (USA).

2006: University of Glasgow, Scotland, UK: EARLY PALAEOZOIC BIODIVERSITY AND CLIMATIC BELTS. Geological excursion to the Lower Palaeozoic of Scotland and northern England

2007: Nanjing Institute of Geology and Palaeontology, Academia Sinica, China: CLIMATE AND EARLY

PALAEOZOIC EVENTS. Geological excursion to Lower Palaeozoic sections of southern China.

2008: Université des Sciences et Technologies de Lille, France: EARLY PALAEOZOIC SEA-LEVEL RECONSTRUCTIONS. Geological excursion to Lower Palaeozoic sections of France and Belgium.

Additional meetings (list not comprehensive):

2004: Tallinn, Estonia: WOGOGO Meeting, session for the Baltoscandian Regional Team. Geological excursion to the Lower Palaeozoic of Estonia

2005: Copenhagen, Denmark: INTERNATIONAL BRACHIOPOD CONFERENCE, session for the Brachiopod Clade Team.

2006: Prague, Czech Republic: CIMP Meeting, sessions for the Acritarch, Chitinozoan and Miospore Clade Teams.

2007: Zaragoza, Spain: Meeting of the peri-Gondwana Regional Team. Geological excursion to the Lower Palaeozoic of the Iberian Chains, Spain

THOMAS SERVAIS

SCIENTIFIC REPORTS

YUE LI (China) AND STEVE KERSHAW (UK) with colleagues from Nanjing are working on Ordovician reefs prior to the end-Ordovician mass extinction in the South China Block. Also, we are investigating the Early Silurian recovery of reefs and benthic faunas in South China, based on literature and our field investigations at key sites in southern Shaanxi, northern Sichuan and northeastern Guizhou Provinces. See abstracts below.

ORDOVICIAN REEF SYSTEMS AND SETTINGS IN SOUTH CHINA BEFORE THE LATE ORDOVICIAN MASS EXTINCTION

Li Yue, Steve Kershaw and Mu Xinan

Abstract - Ordovician reefs of the South China Block occur chiefly in 3 stratigraphic units in ascending order: middle Tremadoc Fenhsiang Formation and upper part of Lunshan Formation; late Tremadoc Hunghuayuan Formation; and middle Ashgill Xiazhen, Sanjushan and Daduhe Formations. The region therefore records the Early Palaeozoic reef expansion episode, and permits assessment of change in reef facies throughout that time. During middle Tremadoc time, lithistid sponge-bryozoan-Calathium-calcimicrobia-dominated patch reefs of Fenhsiang Formation occur in the high energy belt of central Yangtze Platform, near Yichang, W. Hubei Province. Columnar-form stromatolites of Lunshan Formation (same age as the Fenhsiang Formation) occur in the southeastern margin of the platform, located at Shitai, S. Anhui, where low

diversity of reef-attached organisms, and the generally fine-grained character of the sediment, are consistent with a deeper marine environment. The ?receptaculitid *Calathium* and lithistid sponges were the principal reef-builders of late Tremadoc reefs, and were widespread in the areas of Yichang, (W. Hubei Province) and Dongzhi, (S. Anhui Province), from the platform centre to its margin settings. Bryozoan reef builders occur only in the platform centre with a high diversity of reef dwellers such as brachiopods, trilobites and nautiloids. However, during the equivalent time at the platform margins, stromatolites played an important part in reef-building together with *Calathium* and lithistid sponges. Restricted by the black shales of the main part of the Yangtze region, middle Ashgill reef complexes can be found only on the northeast platform of Cathaysian Land, between Yushan (N. Jiangxi) and Changshan (S. Zhejiang) region. Microbial reefs are present on the western margin of the Yangtze Platform. On the northeast platform of Cathaysian Land, patch reefs (some higher relief) with talus, and biostromes of the Xiazhen Formation, consist of high-diversity biotas of corals, stromatoporoids, calcimicrobia, brachiopods and gastropods. The Sanjushan Formation is age-equivalent to Xiazhen Formation, and contains carbonate mud mounds that are composed of abundant calcareous algae and calcimicrobia. Uplift forced a northward extension of Cathaysian Land and caused the regional relative sea-level fall, and the end of accommodation space of this reef complex prior to the first extinction event of the Late Ordovician. The Daduhe Formation microbial mudmounds occur in the near shore belt of Kangdian Land (western margin of the Yangtze Platform) and is paraconformably overlain by the Nancheng Formation, Hirnantian substage. The biotic structures and lithological composition of these reefs, as well as their equivalent units, demonstrate that differentiation of facies was controlled by the palaeogeographic evolution of South China, due to fluctuation of sea-level, magnitude and depth of carbonate platforms, and uplift of platforms during this interval. Also, over this time interval, the reef communities underwent evolutionary changes, so that a sequence of community replacement is evident. Thus, the middle-late Tremadoc lithistid sponge-bryozoan-*Calathium*-microbia community changed to a middle Ashgill coral-stromatoporoid-calcareous algae-microbial community, and shows that the succession of community replacement during the Ordovician took a relatively long time. However, calcareous algae and microbia still maintained their reef building potential in restricted areas where metazoan builders were presumably stressed.

REEF RECONSTRUCTION AFTER EXTINCTION EVENTS OF THE LATEST ORDOVICIAN IN THE YANGTZE PLATFORM, SOUTH CHINA

Li Yue, Steve Kershaw

Abstract - Early Silurian reef reconstruction on the Yangtze Platform, in the northern part of the South China Block, is preceded by a combination of regional and global processes. During most of Ashgill time (Late Ordovician), the area was dominated by Wufeng Formation deep water graptolitic black shales. Reefs disappeared in the middle of the Ashgill Stage, from the northwestern margin of Cathaysian Land (southeastern South China Block), in advance of the Late Ordovician glaciation and mass extinction, due to regional sea-level changes and regional uplift, unrelated to the mass extinction itself. Late Ordovician microbial mudmound occurrence is also found in the western margin of the Yangtze Platform, its age corresponding to the *Dicellograptus* complexus graptolite biozone of pre-extinction time. On the Yangtze Platform, a thin, non-reef-bearing carbonate, the Kuanyinchiao Formation (= Nancheng Formation in some sites), thickness generally no more than 1 m, occurs near several landmasses as a result of Hirnantian regression. Reappearance of the earliest Silurian carbonates consisting of rare skeletal lenses in the upper part of Lungmachi Formation, are correlated to the acensus graptolite biozone, early Rhuddanian of Shiqian, northeastern Guizhou, near Qianzhong Land. Carbonate sediments gradually developed into beds of brachiopods and crinoids from the lower part of Xiangshuyuan Formation, middle Rhuddanian. In the middle part of Xiangshuyuan Formation, biostromes, containing abundant and high diversity benthic faunas such as corals, crinoids and brachiopods, show beginnings of reconstruction of reef facies. Substantial reef recovery occurred in the upper part of Xiangshuyuan Formation, lower Aeronian, as small patch reefs and biostromes. During the late Aeronian, carbonate sediments, especially reefs and reef-related facies, expanded on the upper Yangtze Platform, and radiation of reefs occurred in Ningqiang Formation, upper Telychian. The long period of reef recovery, taking several million years, remains difficult to explain, because redistribution of any refugia faunas would be expected to take place soon after the extinction. Reefs and reef-related facies subsequently declined after Telychian time due to regional uplift of the major portion of the Yangtze Platform. Most carbonate facies therefore do not occur in South China during the rest of Silurian time.

TAXONOMIC AND BIOSTRATIGRAPHIC SIGNIFICANCE OF THE TREMADOC GRAPTOLITE FAUNA FROM NORTHERN YUKON TERRITORY, CANADA.

Alfred Lenz and Dennis Jackson

Abstract - Twenty two graptolite species are described from the Tremadoc portion of the Road River Group. In a 220 m-thick, graptolite-rich section on Peel River, six graptolite biozones are recognised which in ascending order are: *Staurograptus dichotomus*, *Anisograptus matanensis*, *Adelograptus* cf. *A. tenellus*, *Adelograptus antiquus*, *Kiaerograptus pritchardi* and *Paradelograptus kinnegraptoides*. The *Psigraptus* fauna appears to be confined to a single bedding-plane within a thick interval dominated by *Adelograptus* cf. *A. tenellus* and for this reason we propose a new zone characterised by the latter species rather than identify a *Psigraptus* Biozone as in China. The *Adelograptus* cf. *A. tenellus* Biozone has yielded *Adelograptus?* *bulmani* (Spjeldnaes, 1963) which we propose as the type species for the new genus *Ancoragraptus*. Graptolites recorded from the Tremadoc for the first time from Yukon include: *Ancoragraptus bulmani*, *Clonograptus magnificus*, *C.* cf. *C. multiplex*, *C.* cf. *C. rigidus*, *Hunnegraptus copiosus*, *Kiaerograptus?* *bulmani* and *K? kutchini* sp. nov.

THE HUANGHUACHANG SECTION, POTENTIAL AS GLOBAL STRATOTYPE FOR THE BASE OF THE MIDDLE ORDOVICIAN SERIES

Wang Xiaofeng, Chen Xiaohong, Li Zhihong, Wang Chuanshang

Abstract - The Huanghuachang section was proposed as the GSSP for the base of the Middle Ordovician (Wang et al., 2002) (Fig.1). Based on the detailed research and assessment of all information available it is considered that the Huanghuachang section near Yichang, China is superior than the Whiterock Narrows section (Finney, 2000, 2001) and Niqivil section (Albanesi & Ortega, 2001) and fully satisfies the requirements for a GSSP, no matter the boundary biohorizon discussed recently is fixed at the base of the *B. triangularis* Biozone or the base of *T. leavis* Biozone. The conodont succession across the boundary interval is well developed in the Lower Dawan Formation with a great abundance and diversity (Fig.1-2) (Zeng et al., 1983; An et al., 1987; Ni, 1987 in Wang et al., 1987; Wang Z. et al., 1995). Both the warmer water (Midcontinental Province) conodonts, *O. communis*, *J. variabilis*, *T. leavis* and the cool water (the N. Atlantic Province) conodonts, *O. evae*, *B. triangularis* are all found together with the

graptolites, chitinozoans, acritarches, trilobites, brachiopods etc (Fig.3). The *B. triangularis* Biozone is 2.95 m in thickness at the Huanghuachang section. The base of the biozone is located at 2.6 m above the base of underlying Honghuayuan Formation (Fig.1). The biohorizon with FAD of *T. leavis* is just overlain 0.2m above the base of *B. triangularis* Biozone. More importantly an excellent evolving lineage from *Baltoniodus crassulus* to *B. triangularis* via *Baltoniodus cladilatus* (= *Acodus? cladilatus* (Fig.2) can be observed in the boundary interval. So, we prefer to use the FAD of *Baltoniodus triangularis* as conodonts icon for the middle Ordovician base. The boundary between the *O. evae* and *B. triangularis* Biozones is widespread in the Yangtze platform, China (Wang et al., 1992) and Baltoscandia (Lofgen, 1994). In the low latitude regions the FAD of *T. leavis* can be taken as a reasonable proxy for the boundary definition. Associated chitinozoans of the *C. langei* / *C. brevis* Zone (Chen et al., 2002), graptolites of the *C. deflexus* / *D. protobifidus* Zone (Wang et al., 1987), acritarchs of the *Arbusculidium filamentosum* – *Aureotesta clatirata* A.Z. (Brock et al., 1999; Li et al., 2002), brachiopods of the *Leptella* Zone and trilobites of the *Pseudocalymene cyclidrica* Zone (Zeng & Zhou in Wang et al., 1987, Wang et al., 1992), occurring in the boundary interval of the section, provide excellent advantage with extensive precise intercontinental correlation of the boundary and easy reorganization in the relatively shallow-water carbonate facies to deep-water graptolite facies.

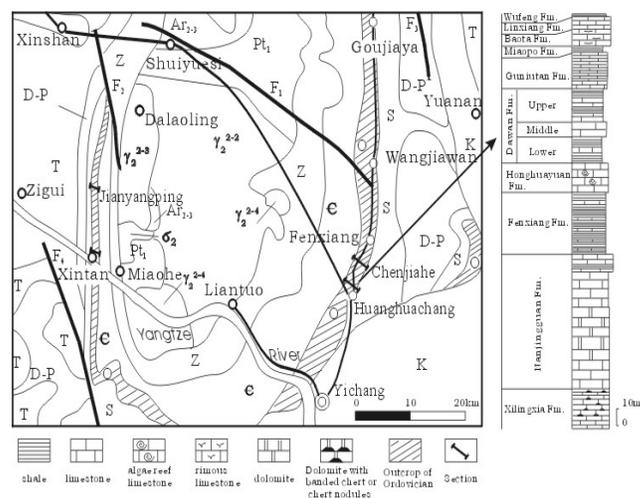


Fig. 1 Sketch geological map in Yichang Area, Hubei, China

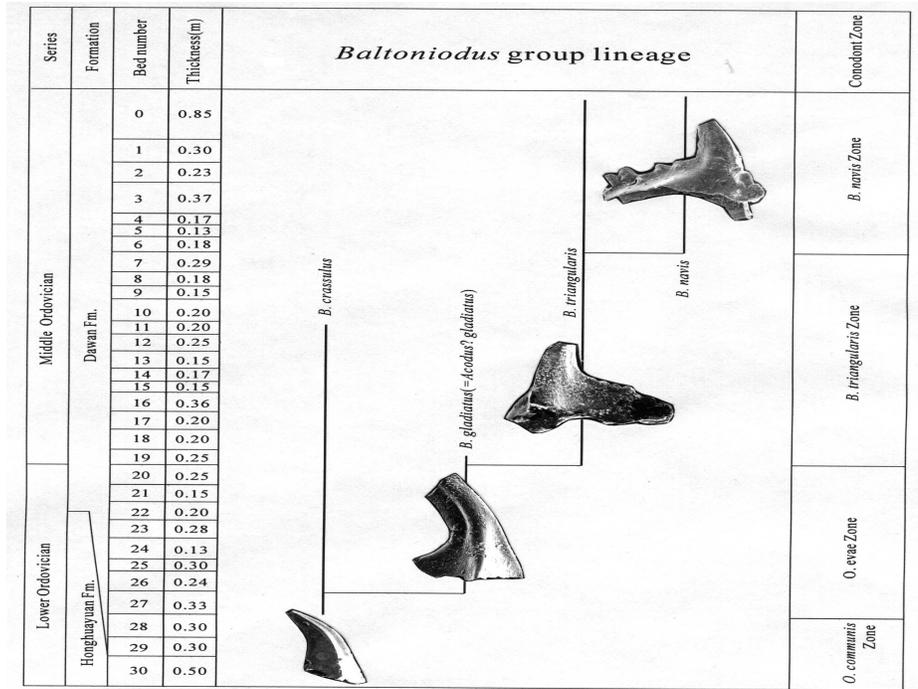


Fig. 2 Showing evolving lineage of *Baltoniodus* group across the Lower/ Middle Ordovician boundary at Huanghuachang section (Based on Li Zhihong).

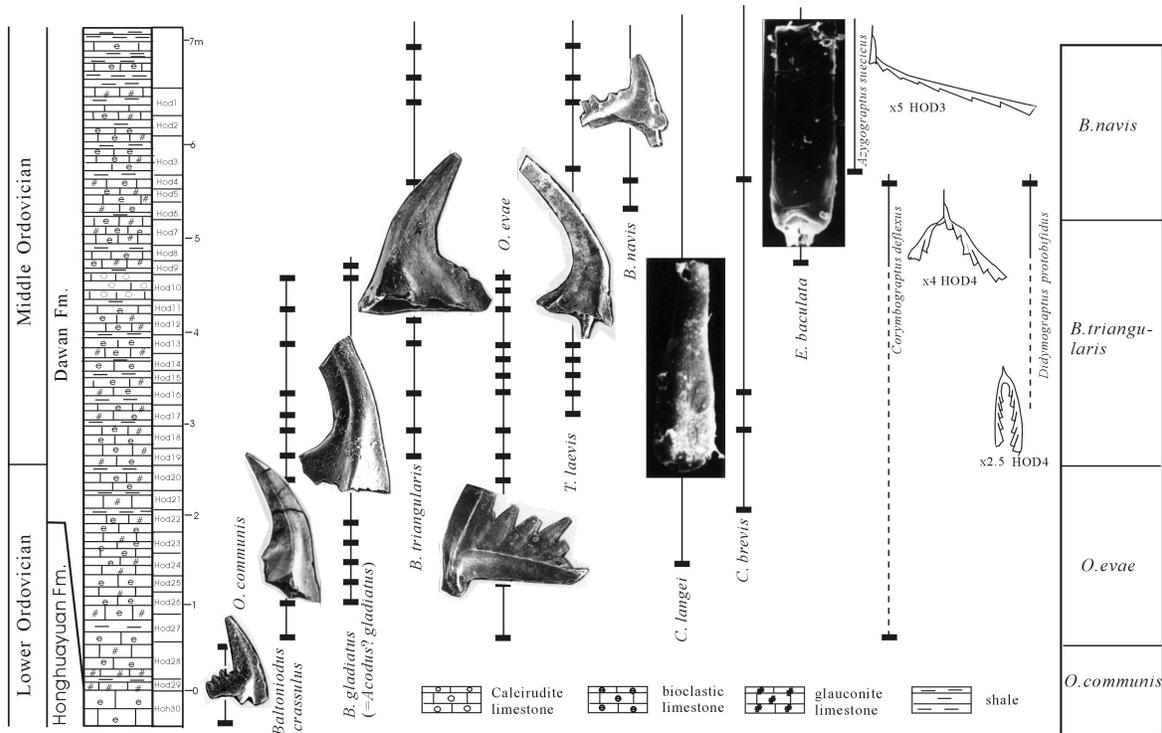


Fig. 3 Stratigraphic column of the Middle/ Lower Ordovician boundary interval at the Huanghuachang section, showing stratigraphic range of major conodonts (Li Zhihong), chitinozoans (Chen & Wang) and graptolites (Wang & Wang) and their sampled position.

HONORARY NOTES

AWARDS

IUGS International Commission on Stratigraphy

ICS Stratigraphy Prizes

Introduction

The International Commission on Stratigraphy (ICS) is a leading Commission of the International Union of Geological Sciences, with responsibility for establishing international standards in stratigraphy such as the International Chronostratigraphical Scale, defined by boundary stratotypes (GSSPs), and the Geological Time-scale.

Definition

Stratigraphy is the core discipline of the Geological Sciences, concerned with the relationships in time and space of rocks (including sedimentary, igneous and metamorphic rocks) and other geological phenomena such as structures. Results and interpretations deriving from other disciplines can only be integrated into a coherent all-embracing geological history if based on sound Stratigraphy.

ICS Prizes

To emphasise the key role of Stratigraphy the International Commission on Stratigraphy is establishing two ICS Prizes, to be awarded every four years during an International Geological Congress. The first awards will be made at the 32nd IGC in Florence, 2004.

The awards will be made at two levels:

1. The **Digby McLaren Medal** will be awarded to honour a significant body of internationally important contributions to Stratigraphy sustained over a number of years. The contributions can be in research (through publication of papers, monographs or books) or in education (through development of influential educational material or resources). It is expected that a major proportion of this work be published in an international language. The medal is named in honour of the Canadian geologist Digby McLaren who was so influential in developing the key "golden spike" concept of a GSSP with reference to the Silurian/Devonian boundary, and a major force in the International Geological Correlation Programme (IGCP).

2. The **ICS Medal** will be awarded to honour high quality research in Stratigraphy by recognising a singular major achievement in advancing stratigraphical knowledge. The research can be either in the development of new methods of analysis in Stratigraphy or in the presentation of new data and/or interpretation of the geological history of an area. No limitations of size or scale are suggested. The geographical scope of the work need not necessarily be international, but the work should be an internationally significant contribution of new and important knowledge. The language of publication of the work is not important and one single paper of distinction or a series of papers over a short time that have the same impact may be involved.

Nominations and Selection

Nominations for either of the Awards are solicited from any source, not just members of the Commission and its Subcommissions. Please give a brief biographical background, a reasoned case for the Nominee and, if necessary, translation of at least abstracts into English so that independent judgements can be made.

The ICS has established a committee to elicit and evaluate nominations for the two ICS Prizes, before making recommendations to all members of the Commission, who must approve the nominations by a clear majority vote.

Nomination documents should be submitted to:

EITHER

Dr. Nicol Morton
Le Chardon, Dept. of Geological Sciences, Quartier
Brugière, 07200 Vogüé, France
Tel. ** 33 4 75 37 03 80
E-mail: NICOL.MORTON@wanadoo.fr

OR

Prof. Stan Finney
California State University
Long Beach, CA 9084
USA
Tel. ** 1 562 985 8637
E-mail: scfinney@csulb.edu

By (date to be established)

For further information please contact either Nicol Morton or Stan Finney.

During the year 2002 John C. W. Cope was awarded the Coke Medal of the Geological Society of London.

IN MEMORIAM

IVO CHLUPAC (1931-2002).

Ivo Chlupac, famous Czech geologist, stratigrapher and palaeontologist, died on November 7th 2002 in Praha. He had been educated at the Geological-Geographical Faculty, Charles University, Praha. Although his lifelong professional career is related to the Czech Geological Survey, Praha, after the political changes in 1989, he habilitated to Professor and became Director of the Institute of Geology and Paleontology at Charles University in Praha. His name is associated especially with studies of various aspects of Devonian strata and fossils (esp. trilobites, phyllocarids and goniatites), and, particularly, with the International Stratotype of the Silurian-Devonian Boundary. However, he published also several very important papers on metamorphosed sedimentary formations and on the Ordovician of the Barrandian area (studies on non-trilobite arthropods – crustaceans, chelicerates, and problematic taxa).

Ivo Chlupac was one of leading experts of the Czech geology, very widely experienced, extremely liking field work. His knowledge, exactitude, interest and enthusiasm predestined him to work on many topics in the Paleozoic, from the Cambrian up to the Carboniferous. With his personal modesty and kindness Professor Ivo Chlupac has influenced at least two generations of Czech geologists, and with his numerous articles and books he will certainly influence many future generations. He gave courses on historical geology at Charles University and in this activity he continued as Emeritus Professor up to October 2002 when the illness took hold on him. Ivo Chlupac worked for international stratigraphical commissions, the most important membership (since 1974) was in the International Subcommission on Devonian Stratigraphy. He is also the author of several well-known popular guidebooks to the Barrandian area.

PETR KRAFT, JAROSLAV KRAFT AND VACLAV PETR

MISCELLANEA

COMMENTS

Requests: 1) I am always in search of good fragments of *Dictyonema retiformis* Hall (well preserved proximal parts and pieces of stipe) to distinguish between *Dictyonema* and *Rhabdinopora*. 2) Is there a specialist of green algae of Lower Ordovician (Upper Tremadoc-Lower Arenig) to study well preserved

material? If yes, please write to Ph. Legrand with references.

PHILIPPE LEGRAND

Since 2001, the “Riphaean to Silurian Subcommission of Germany” has an own website. For Ordovician workers it is available under the URL: www.ordovizium.org

SÖREN MEISEL

The Glenogle Formation was the western and basal equivalent of shallow water carbonates of the North American craton from Arenig (*fruticosus*-*approximatus* Zone) to early Caradoc time (*gracilis* Zone). The publication revises the Glenogle’s graptolite faunas and demonstrates their relationships to coeval conodont faunas and also to the well-known brachiopod and trilobite faunas of the western part of the North American craton. Some deeper water trilobites are present in the Glenogle and have similarities to faunas in the Precordillera of northern Argentina.

B. S. NORFORD, D. E. JACKSON AND G. S. NOWLAN. 2002. Ordovician stratigraphy and faunas of the Glenogle Formation, southeastern British Columbia. Geological Survey of Canada, Bulletin 569, 83 pp., 6 Plates, 39 figs., 2 tables.

BRIAN NORFORD

BOOKS & JOURNALS

LETHAIA, an international journal of palaeontology and stratigraphy, long identified as the official journal of the International Palaeontological Association is now also **The Official Journal of the International Commission on Stratigraphy.**

As you are aware, following the ICS meeting in Urbino, the ICS executive has been exploring opportunities to develop a single, identified publication outlet for ICS products. I am pleased to announce that at a meeting in Copenhagen on 27 May the Board of Lethaia Foundation and the executive committee of the ICS agreed to a publication arrangement. A draft of the Memorandum of Understanding is attached.

The benefits to ICS of this arrangement are threefold. Subcommission activities generate a multitude of published products (scientific articles, proceedings volumes, thematic books, monographs, correlation charts, etc.) that are widely dispersed in the literature, involve a great variety of publishers, and differ greatly in format, distribution, and circulation. Although

Subcommission products can still be produced by publishers other than Lethaia, publication in Lethaia will ensure a common, high quality format for ICS publications, a common place to find ICS products, and, in turn, a clearer identification, greater distribution, and increased visibility of ICS publications. Thus, the activities of the ICS Subcommissions will have greater visibility. And, should the publication arrangement result in increased subscriptions to Lethaia, ICS will receive royalties that will be returned to the Subcommissions as support for their scientific activities and publications. Lethaia, in turn, should benefit. With the increased scope of its publications, it will appeal to a wider audience and subscriptions are expected to increase significantly.

Felix Gradstein asked me to work with David Bruton of the Lethaia Foundation Board to develop this publication arrangement. Now that it is a reality, I call upon you, the leaders of the Subcommissions, to make it a success, that is, to generate products and to direct them to Lethaia for publication. After all, it is not the ICS executive but the members of Subcommissions that generate the science that results in published products, and it will be the activities and products of the members of the Subcommissions that will be highlighted and supported through publication in Lethaia. I request that you distribute this announcement to all members of your respective subcommissions and that you actively solicit and promote publications in Lethaia. I will continue as a liaison between ICS and the Lethaia Foundation Board and Editorial Office, working to coordinate publication of ICS products in Lethaia. I request that you inform me of all submissions and ideas for potential submissions, although authors and editors of ICS publications will work primarily with the Lethaia editorial office and Editor-in-Chief Svend Stouge through the submission to publication process.

STAN FINNEY

Memorandum of Understanding

between *Lethaia Foundation* and
International Commission on Stratigraphy

The Board of the Lethaia Foundation and the Executive Committee of the International Commission on Stratigraphy agreed on the following for a trial period of three (3) years.

1. Lethaia will be recognized as a *formal publication outlet for the International Commission on Stratigraphy (ICS)*. This will be noted on the inside cover page of each issue. Papers accepted for publication can carry the ICS logo, preferably placed after the acknowledgements.
2. Papers sponsored by ICS will be subjected to the same review procedures as for other articles submitted to Lethaia.
3. A variety of papers will be submitted from ICS varying from typical science based journal articles, thematic series, discussion and news items or large monographs and proceedings volumes. Some of the larger submissions may be published in *Fossils & Strata*, if full printing costs are provided by ICS.
4. An annual evaluation of the success of this joint venture will be made by the Lethaia Foundation. After three years, there will be a thorough evaluation that reports on anticipated increases in subscriptions (both individual and institutional), the standard of submitted manuscripts on stratigraphy and number of pages/issues published. Should the arrangement lead to a significant increase in numbers subscribing to Lethaia /*Fossils & Strata*, then ICS will receive a royalty the size of which is open to negotiation.
5. At some stage, a membership category will be considered for individuals subscribing to Lethaia through ICS.

Forthcoming in March 2004

The Great Ordovician Biodiversification Event

Edited by Barry D. Webby, Florentin Paris, Mary L. Droser and Ian G. Percival

Two of the greatest evolutionary events in the history of life on Earth occurred during Early Paleozoic time. The first was the Cambrian explosion of skeletonized marine animals about 540 million years ago. The second was the "Great Ordovician Biodiversification Event" and the focus of this book. During the 46 million-year-long period of Ordovician time (489-443 m.y), a bewildering array of adaptive radiations of "Paleozoic- and Modern-type" biotas appeared in oceanic habitats, the first animals (arthropods) walked on land, and the first non-vascular bryophyte-like plants (based on their cryptospore record) colonized areas with damp environments on land.

This book represents a compilation by a large team of Ordovician specialists from around the world, who have enthusiastically cooperated to produce this first globally orientated, internationally sponsored IGCP (International Geological Correlation Program) project on Ordovician biotas. The major part is an assembly of genus and species level diversity data for the many Ordovician fossil groups. The book also presents an evaluation of how each group diversified through Ordovician time, with assessments of patterns of diversity change, and rates of origination and extinction. As such it will become the standard work and data source for biotic studies on the Ordovician period.

About the Editors

Barry Webby is at the Department of Earth & Planetary Sciences, Macquarie University.

Mary Droser is at the Department of Earth Science, University of California, Riverside. **Florentin Paris** is at the Geoscience research unit of the CNRS at the University of Rennes. **Ian G. Percival**, is in the Geological Survey of New South Wales, Australia.

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6 halftones 19 tables
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CURRENT RESEARCH

ACEÑOLAZA, FLORENCIO G. (Argentina). I keep on working in different biostratigraphic aspects of Ordovician strata of Argentina. Together with some colleagues (A. Toselli - ARG., A. Sial - BRASIL and H. Miller - GER) we are working on new data supporting a para-autochthonous origin for the Precordillera. This last two years have been devoted for the organization of the 9th ISOS in western Argentina, and the edition of a monographic book entitled "Aspects of the Ordovician System in Argentina".

ACEÑOLAZA, GUILLERMO F. (Argentina). I am actually working on biostratigraphy of the Cambro-Ordovician sequences of NW Argentina and Famatina System, focusing on Trace fossils and some newly discovered soft body faunas. Research is being carried out associated to Franco Tortello, Susana Esteban (Tucumán) and Juan Carlos Gutiérrez-Marco (Spain). Highly fossiliferous strata have been recently discovered in ceirtan areas, where few students have begun their final research projects and Doctoral Thesis. Finally I am also involved in the Organization of the ISOS 2003.

ACHAB, AÏCHA, ESTHER ASSELIN AND AZZEDINE SOUFIANE (Canada) are continuing their investigations on the biostratigraphy, the biodiversity and the paleogeography of Chitinozoa of Laurentia. In 2002, their participation to the 1st International Paleontological Congress (Sydney, Australia) and the CIMP Meeting (Lille, France) is to be mentioned as speakers or co-authors for the talks on the Ordovician global and regional biodiversity of Chitinozoa of the Project IGCP no 410 (Achab et al. and Paris et al.), the Late Ordovician and Early Silurian chitinozoans of Arctic (Soufiane et al.), the chitinozoan contributions for the project on the Appalachian Foreland and Platform Architectures in eastern Canada (Asselin et al.) and for the poster on the chitinozoan references database, Chitiref (Verniers et al.).

AINSAAR, LEHO (Estonia). I continue working on sedimentology and stable isotope geology of Ordovician carbonates in Baltoscandia (with Tõnu Meidla, Andrei Dronov, Tõnu Martma and Oive Tinn). Together with Mark T. Harris, Peter Sheehan, Linda Hints, Jaak Nõlvak, Peep Männik and Madis Rubel we continue a comparative study on Baltoscandian and Great Basin Upper Ordovician-Silurian carbonate platform sequence stratigraphy.

ALBANESI, GUILLERMO L. (Argentina). I am working on projects dealing with Lower Paleozoic conodont faunas from the Argentine Precordillera, Famatina System, and NW Argentine basins. By means of conodont high resolution biostratigraphy linking graptolite records (studied by Gladys Ortega) we are trying to assemble an integrated biostratigraphic chart for the Ordovician and Silurian Systems of Argentina. Other projects include the participation of colleagues from different universities of Argentina, Spain, USA, and Canada, who are devoted to related topics of historical geology of the Lower Paleozoic. One of the goals we are pursuing current year is the proposal of a global stratotype for the base of the Middle Ordovician Series in the Argentine Precordillera. On the other hand, I am involved in the organization of the international event "9th International Symposium on the Ordovician System, International Graptolite Conference, and Field Meeting of the International Subcommittee on Silurian Stratigraphy" and related field trips that will be held in San Juan, Argentina, on August 18-21 2003 (see web site: <http://www.cricyt.edu.ar/2003.htm>).

On December 2003, a post-graduate course on conodont-graptolite paleobiology and geological applications is planned to be given at the National University of Córdoba, Argentina (<http://www.efn.unc.edu.ar/escuelas/4to/dcg/>).

ALVARO, JOSÉ JAVIER (France). I am working in two Ordovician topics, the Cambro-Ordovician transition and the Ashgillian climatic effects on faunal assemblages in North Africa and western Europe, in collaboration with the French-Spanish Enrique Villas's team. Daniel Vizcaïno (Carcassonne) and I are trying to make a deep revision of the Lower Ordovician litho- and biostratigraphic units in the southern Montagne Noire, in order to uniformize them with those of neighbouring regions.

ANTOSHKINA, ANNA I. (Russia). I'm actively working on the lithology problems of the Lower Paleozoic sequences in the north part of the Western Urals and Timan-northern Ural region.

ARMSTRONG, HOWARD A. (UK). I'm actively working on projects relating to documenting Hirnantian glacial dynamics at high latitudes with a view to correlating these with low latitude records. At present this is largely a delta 13C isotopic study. Conodont work continues with projects on growth and the role of heterochrony in conodont cladogenesis.

BAGNOLI, GABRIELLA (Italy). I'm actively working together with R. Albani and C. Ribecai on Ordovician fossil associations from the Cantabrian Zone (Spain). The fossil associations include well preserved acritarchs, chitinozoans and conodonts. The research is in

cooperation with J. C. Gutierrez-Marco and G. Sarmiento.

BARNES, CHRIS (Canada). I am completing recent field-based Lower Paleozoic conodont studies in the Canadian Cordillera, based on four detailed platform-to-basin transects in the southern, central and northern Rocky Mountains (with Leanne Pyle). Several papers and a major monograph have appeared recently, are in press or in preparation. Shunxin Zhang is completing her Research Associate project using my extensive conodont database to relate conodont biostratigraphy, biofacies and biogeography to the pattern of eustasy and tectonism that affected northern Laurentia in the early Paleozoic. Several recent papers or in press deal with conodont taxonomy, evolution, cladistics, paleoecology and the response of the conodont communities to eustatic change. The conodont geochemistry of Lower Paleozoic conodonts, as a proxy for ancient paleoceanography is under further investigation in a new project with Julie Trotter (Australian National University). Work completed, nearing completion or in process includes: Ashgill to Wenlock conodonts from the Canadian Arctic with David Jowett; Ashgill conodonts of the Whitland section, South Wales with Annalisa Ferretti; Nd isotope work (with Cindy Wright and Stein Jacobsen, one paper published, one in preparation). Two short introductory chapters have been submitted for the IGCP 410 final volume on Ordovician paleoceanography, paleoclimatology and on the Ordovician superplume.

BAUER, JEFF (USA) is completing a study on the conodont faunas from the Joins and Oil Creek formations (Whiterockian) of south-central Oklahoma.

BENEDETTO, JUAN LUIS (Argentina). I am continuing to work on Ordovician brachiopods from western Argentina, biostratigraphy and paleobiogeography. I completed work on Arenig brachiopods from the Famatinian volcanosedimentary rocks and on Tremadoc brachiopods from northwestern Argentina. Particularly interest is being devoted to the early radiation and evolutionary trends of orthids on Godwanan siliciclastic shelves. Currently, I am involved in the edition of a book entitled 'Ordovician fossils of Argentina' which provides a comprehensive and fully illustrated account of Ordovician Argentine fossils (sponges, bryozoans, brachiopods, bivalves, rostroconchs, trilobites, ostracods, graptolites, trace fossils). It has been written by 14 research-active Argentine authors working together in teams from five universities and other research centres. The book includes a summary

of available stratigraphic and biostratigraphic information from Ordovician basins of Argentina (Precordillera, Famatina, Central Andean and Puna), as well as information on paleobiogeography, paleoecology, and biotic events in the context of the geodynamic evolution of Gondwana. Taxonomic chapters include short descriptions of taxa and more than 100 high-quality photographic plates covering most of described species. A complete bibliography of around 2000 references provides a valuable source of information on Ordovician geology, stratigraphy and faunas of Argentina. I hope this volume will be concluded before the next 9th International Symposium on the Ordovician System that will take place in August 2003 at San Juan, Argentina.

BERESI, MATILDE SYLVIA (Argentina). I am currently working on a collaborative project with S. Heredia (Comahue University) on Lower -Middle Ordovician stratigraphy, microfacies and conodonts from San Rafael Block, southern of Mendoza province and on platform sequences from the San Juan and Mendoza Precordillera. We have finished two papers (now in press): on the Ordovician stratigraphy of the San Isidro area, which includes the lithostratigraphical units and biozones, and on Ordovician microfossils from La Pampa province. A third paper on a Middle Ordovician carbonate sequence from the Central Precordillera of San Juan (conodonts, microfacies and paleoenvironmental analysis) is now approaching completion. Robert Frey (Ohio) and I are examining the nautiloid systematic from the San Juan Precordillera. In cooperation with Argentine workers we are involved in the organization of the 9 ISOS, 7 IGC and SSS field meeting, to be held in San Juan city, western Argentina, August 2003.

BLIECK, ALAIN R. M. (France). In 2001-2002, active work on Ordovician vertebrates has been restarted in collaboration with Susan Turner (Queensland Museum, Brisbane, Australia) who spent three months in my CNRS-USTL research team, last year; we made a full review of all Cambrian and Ordovician supposed and confirmed vertebrates, from all over the World, viz., North America (USA and Canada), South America (Bolivia and Argentina), Australia, Russia (northern European Russia, Siberia, Tuva-Mongolia), and possibly China and South Africa; this review does not include conodonts, which are not considered as vertebrates in our analysis, but as basal chordates at the best; it is based upon a full systematic and biostratigraphic revision of all known taxa and localities; this project has been made through the auspices of IGCP 410 on the Great Ordovician Biodiversification Event (co-lead by B. Webby, M. Droser and F. Paris).

BUATOIS, LUIS ALBERTO (Argentina). I am particularly interested on the sedimentology and sequence stratigraphy of the Cambrian-Ordovician deposits of northwest Argentina. Present research is focused on the Late Cambrian-Tremadocian Santa Rosita Formation. Although the Cambrian-Ordovician boundary has been the topic of many biostratigraphic papers, surprisingly there is a remarkable absence of detailed stratigraphic sections and only a few studies deal with the associated sedimentary facies and paleoenvironmental aspects of the Cambrian-Ordovician successions. Additionally, I am helping Gabriela Mángano in her studies of lower Paleozoic ichnofaunas.

CARRERA, MARCELO (Argentina). I'm continuous working on taxonomy of sponges, bryozoans and paleoecology of Ordovician communities including reef-related organisms. In the last two years my activities focused on the sponge diversification patterns, as a result the sponge chapter co-authored by Keith Rigby is in printing process as part of the book edited by Barry D. Webby, Mary L. Droser, Florentin Paris and Ian G. Percival "The Great Ordovician Biodiversification Event" *Columbia University Press*.

CECH, NORMA (Argentina). I'm actively working on a detailed paleoecological study of the Ordovician communities from the San Juan limestones in the Argentine Precordillera, as a major part of my Ph.D. project. Analysis of community dynamics, including evolution of particular clades, and comparisons with long term patterns of ecological change are the main objectives of this project.

CHEN, XU (China). My current research projects are 1. Latest Ordovician to earliest Silurian graptolite extinction and recovery; 2. A study of the Ordovician stratotype sections in China.

CHOI, DUCK K. (Korea). My research on the trilobites of the Cambrian-Ordovician boundary intervals in Korea is still continuing and has made a significant progress in collecting more specimens from the same locality introduced in Ordovician News No 19. In the same locality we also found a good exposure yielding a Middle Ordovician invertebrate fossil assemblage. The section is currently under investigation for getting more detailed information on sedimentology and paleontology. In addition to two published papers reported in this issue, two papers were accepted for publication in 2003 and a big manuscript on the Tremadocian stylophoran echinoderms from Korea (along with Seung-Bae Lee and Bertrand Lefebvre) was submitted to *Palaeontology*.

CINGOLANI, CARLOS (Argentina). I am actively working on the Ordovician siliciclastic rocks from the San Rafael Block, Mendoza province, Argentina. Sandstone petrography, geochemistry (major, trace and rare earth elements) and Nd isotopic composition were analysed for the Lower Caradoc Pavón Formation. These data constrain the provenance and tectonic setting deposition, and allow comparison with equivalent Ordovician units along the proto-Andean Gondwana margin. A paper with these conclusions was submitted on the IGCP 436 special volume to be published by *J. South Am. Earth Sc. Rev.* Two PhD thesis, under my direction (one with U. Zimmermann as co-director), are in progress about the provenance and tectonic setting of the Precordillera Lower Paleozoic units, using geochemistry, isotope geology and geochronology from detrital minerals. I am starting another line of research in Ordovician siliciclastics with the fission tracks thermochronology on apatite and zircons, in collaboration with the Federal University of Rio Grande do Sul group. I am currently working, as a part of the research group, in the Ordovician Precordilleran K-bentonite project, in collaboration with W. Huff, S. Bergström, D. Kolata and R. Astini. I am collaborating with S. Heredia on the preparation of the "Ordovician of Mendoza Field Trip Guide" for the 9th ISOS 2003 to be held in San Juan, Argentina. Several abstracts on the provenance aspects of the Ordovician siliciclastics from San Rafael Block were presented at the: Meeting of the International Association of Sedimentologists (Johannesburg, South Africa), IGCP 436 Tectonic Evolution of the Pacific Gondwana Margin, and Asociación Argentina de Sedimentología.

COCKS, ROBIN (UK). 2002 was a busy year, with further visits to Trondheim to work with Trond Torsvik on Palaeozoic terrane positioning using fossils, palaeomagnetism, sedimentology and kinematic continuity. Papers were completed with Trond on Ordovician terranes for the Webby IGCP 401 volume and with David Harper and others on brachiopod extinctions for the same volume, and with Roger Cooper on an end-Ashgill Hirnantia Fauna from New Zealand, the first recorded from that country. A substantial review on Ordovician terrane positioning and biogeographical analysis with Richard Fortey was accepted by *Earth Science Reviews*. Work continued with Leonid Popov on the late Caradoc Degeres Beds brachiopod fauna from the Chu-Ili Terrane of Kazakhstan, and a paper was submitted with Petras Musteikis on a review of the Silurian strophomenoid brachiopods from Baltica, with particular reference to their occurrence in the boreholes of Lithuania.

COIRA, BEATRIZ (Argentina). I am working on Ordovician magmatism. Our studies are focus on detail petrological analyses of plutonic and volcano-sedimentary sequences, looking for to place constraints on magmatic sources, tectonic setting of the magmas, their style of emplacement and eruptive mechanism.

They attempt to understand the magmatotectonic evolution of Puna during Ordovician times and it's implications in the reconstruction of the southwestern Gondwana margin.

Another purpose of our research is to define mining prospection and exploration guidelines to apply in stratabound deposits hosted in Ordovician paleovolcanic environments.

COOPER, ROGER (New Zealand). A method for compensating for bias introduced in the conversion of stratigraphic range chart data to diversity curves has been included in the IGCP 410 volume on the great Ordovician Biodiversity Event (Webby, Droser, Paris, editors). This problem is circumvented in the computer optimising method (CONOP) used by Peter Sadler and myself for the Ordovician and Silurian timescales. In addition to the scaled composite, from which the timescale is derived, the method produces a standing diversity curve through the Ordovician to earliest Devonian, particularly interesting as it spans the entire stratigraphic range of the graptolite clade. It also produces very precise stratigraphic ranges of species, that will be a sound base for studies of macroevolutionary rates. The database now comprises over 1400 species and 200 stratigraphic sections worldwide. The description of late Eastonian to early Bolindian graptolites from Wangapeka Valley, New Zealand, has been completed (with Fons VandenBerg), and description of a Hirnantian trilobite-brachiopod fauna from the same area (with Robin Cocks) has also been completed.

COPE, JOHN C.W. (UK). Earlier in the year I completed a study with Fang Zong-Jie (Nanjing) of a late Arenig bivalve fauna from West Yunnan that includes description of several new genera and species. I also completed the Bivalve and Rostroconch chapter for the IGCP 410 volume edited by Webby, Droser & Paris. Both of these are in course of publication. I am now aiming to describe various minor fossil groups that occur in the Arenig faunas of South Wales; the first of these comprises the octocorallian and hydroid fossils. However, much of my research time in the immediate future will be concentrated on my Jurassic interests, with preparation and editorship of a 2nd edition of the British Jurassic Correlation Charts and a chapter on

the Jurassic for the 2nd edition of *The Geology of England and Wales*.

ELIAS, BOB (Canada). I'm studying various aspects of corals and environmental change during the Ordovician radiation, mass extinction, and Early Silurian recovery. Research with Graham Young focuses on the diversity, paleoecology, community structure, and morphologic trends of coral faunas. A collaborative project is underway with Graham, Godfrey Nowlan, Dave Rudkin and others on a spectacular Late Ordovician-Early Silurian archipelago with rocky shorelines, exposed in the Churchill area of northern Manitoba. Dong-Jin Lee (Korea) and I are examining the paleobiology of tabulate corals from the Middle Ordovician of Tennessee and Late Ordovician of southern Manitoba. Research with Xu Shaochun (recent Postdoctoral Fellow) on the latest Ordovician solitary rugosans of South China is nearing completion. Adam Melzak (Ph.D. student) is working on the Late Ordovician to earliest Silurian rugose corals of Anticosti Island, Quebec. Simon Wong (recent M.Sc. student) finished a thesis on the paleoecology and paleoenvironments of the famous Late Ordovician "Tyndall Stone" in southern Manitoba. M.Sc. and Ph.D. projects are available on Ordovician corals, paleoecology and stratigraphy (please see <http://www.umanitoba.ca/geoscience/faculty/elias/elias.html>)!

ERDTMANN, BERND-D. (Germany). During the year 2002 my activities on Ordovician research were somewhat subdued due to my involvement as a German project co-leader and principal investigator on a Sino-German cooperation project on the Neo-Proterozoic-Earliest Cambrian development of Life on the Yangtze-Platform in China. Nevertheless, I had the pleasure and honour to host in Berlin ZHANG Yuandong from the Nanjing Institute of Geology and Palaeontology with whom four manuscripts were completed and submitted on Early Ordovician (mainly Tremadoc) graptolites and stratigraphy in China and another one is in preparation on the fine-stratigraphically logged graptolite sequence of the Tremadocian Alum Shales, Bjerkaasholmen Limestone and Hagastrand Shales of Slemmestad near Oslo, Norway (with Zhang Yuandong). Furthermore, a review of *Staurograptus* and *Aletograptus* from the basal Ordovician sequence of Green Point, western Newfoundland and a manuscript on Rhabdinopora from southern Bolivia are submitted for publication jointly with Feng Hongzhen from Nanjing University. A joint manuscript has been completed and is now in press by Sven Egenhoff (Techn. Univ. Freiberg, Germany) on the Ordovician sequence in southern Bolivia. For 2003-2004 there are plans for cooperation projects on the correlation of Ashgill to early Llandovery graptolite successions between Germany and China (South China

Plate and Indochina-Sibumasu Terranes) with Chen Xu and Fan Junxuan (NIGPAS).

ETTENSOHN, FRANK R. (USA). I am currently working on the stratigraphy, paleontology, seismic event horizons, and depositional environments in the Middle/Late Ordovician Lexington Limestone in central Kentucky, U.S.A. In particular, I am especially interested in how Taconian, far-field, tectonic effects influenced carbonate deposition Lexington Limestone in a distal, cratonic setting.

FINNEY, STAN (USA) is working on the following: 1) data analyses and manuscript preparation for project on geochronology and provenance of Cambrian to Devonian age siliciclastic strata in Argentine Precordillera with S. Peralta, G. Acenolaza, G. Albanesi, J. Gleason, and G. Gehrels; 2) preparation of manuscript documenting graptolite fauna, biostratigraphy, and sequence stratigraphy of Late Ordovician sections in central Nevada; 3) mapping of structure and stratigraphy of Roberts Mountains allochthon in Roberts Mountains, Nevada; and 4) preparation of paleoecology chapter of new graptolite Treatise.

FLOYD, JIM (UK). Myself and several colleagues in the Southern Uplands Project at the British Geological Survey are currently mapping in the Ordovician Northern Belt in the Moffat area (Sheet 16W) of Scotland and will extend north-eastwards towards the east coast over the next few years. BGS publications are in press describing the geology of the Leadhills area (Sheet 15E), Scotland. Work is also ongoing on heavy minerals from Ordovician sandstones of the Northern Belt, Southern Uplands, Scotland.

FREY, ROBERT C. (USA). I recently completed a compilation of data on nautiloid abundance and diversity in the Ordovician as a member of the nautiloid clade group (S.M. Beresi, D.H. Evans, A.H. King, and Ian Percival), part of the IGCP 410 Project on the Ordovician Biodiversity Event. These data comprise a chapter in an in-press volume on "The Great Ordovician Biodiversification Event" to be published by Columbia University Press. Although the demands of my "real job" as an environmental geologist continue to seriously limit the time I can devote to paleontological research, I am in the process of revising a manuscript on Ordovician nautiloids from British Columbia for the Canadian Geological Survey (with assistance from Brian Norford), am providing assistance to Matilde Beresi (Argentina) regarding a descriptive paper on Lower-Middle Ordovician nautiloids from San Juan

Formation in the Argentine Precordillera, and hope to start work on another manuscript describing a very diverse early Upper Ordovician (Caradoc equivalent) nautiloid fauna from the Platteville Formation in the east-central U.S. with John Catalani.

GANIS, ROBERT (USA). I have extended my graptolite biostratigraphy/ stratigraphic succession research for the Taconic Martinsburg/ Hamburg Terrane, Pennsylvania, USA for a second year for my postgraduate work at the University of Leicester. I have completed the Llanvirn graptolite systematics (with some new taxa) for the mid Iapetus allochthons, and am now back in the US working on the autochthonous Caradoc foreland. Although structurally complicated, I have been able to construct a relatively positioned stratigraphic stack in the mid to upper gracilis zone and from the *bicornis* zone up into the clingani zone. This is providing a nice test of the graptolite faunal ranges reported by others around North America and the rest of the world. I hope to publish all this work as soon as feasible

GHOBADI POUR, MANSOOREH (Iran). I am working on Ordovician trilobites of Iran in two areas: Eastern Alborz, northeast of Iran and Tabas area, east of Central Iran. The main purpose of this research is taxonomy, biofacies, biostratigraphy and paleobiogeography of Ordovician trilobites in Iran, because there are controversies between previous reports and there is not any precise data in these subjects.

GONCUOGLU, YAKUT (Turkey). I am continuing to study the conodonts of the Ordovician successions of the Taurides with Graciella Sarmiento (Madrid) and Huseyin Kozlu (Ankara). We have concentrated our studies on the discontinuous Darriwilian limestones (Tekmen Mb) and the shallow-marine Arenig limestones (Sobova Fm.) in different tectonic units of the Tauride belt. We have recently sampled the nodular limestone bands that follow the Cal Tepe Limestone, a diachronous formation that yielded recently earliest Ordovician conodonts in the Eastern Taurides."

HARPER, DAVID A. T. (Denmark). Research continues on Ordovician stratigraphy and faunas in Scotland (with Euan Clarkson and Alan Owen), Ireland (with Matthew Parkes), Greenland (with Svend Stouge, Jørgen Christiansen, Doug Boyce and Ian Knight) and Russia (with Arne Thorshøj Nielsen). Fieldwork in western Russia focussed on Putilova Quarry (with Arne Thorshøj Nielsen, cand. scient. students Christian Macørum and Kristian Jakobsen together with Andrei Dronov) is further advancing our understanding of faunal changes, sea level fluctuations and environmental parameters during the Ordovician radiation on the Baltic palaeoplate. Work continues with Rong Jia-yu, Chen Xu

and Zhan Ren-bin on refining events during the late Ordovician and early Silurian in South China, a critical area for the understanding of the Hirnantian Substage. Joint manuscripts are in press on Darriwilian brachiopod faunas and early Silurian brachiopod assemblages from South China.

Øyvind Hammer has continued his work on the Baltoscandian database with assistance from many palaeontologists in the region; the database can be investigated at <http://asaphus.uio.no/>. Further enhancements of PAST have increased the popularity of this free software package for palaeontologists (*PAST - PAleontological STatistics Software. Version 1.04.* <http://folk.uio.no/ohammer/past>).

An extensive chapter on Ordovician brachiopod diversification, in connection with IGCP project 410, is in press with Columbia University Press. Both the taxonomic and ecological components of the radiation have been tackled by a range of authors (David A.T. Harper, L. Robin M. Cocks, Leonid E. Popov, Peter M. Sheehan, Michael G. Bassett, Paul Copper, Lars E. Holmer, Jin Jisuo and Rong Jia-yu); the book is scheduled for publication in 2003.

A substantial volume arising from the WOGOGO meeting in Copenhagen (May 2001) is in press with the Bulletin of the Geological Society of Denmark (Harper and Stouge, guest editors). The volume contains 12 papers covering a wide range of aspects of the Ordovician geology of Baltoscandia and will be published in April 2003.

HARRIS, MARK (USA). I am working with Peter Sheehan, Leho Anisaar, Linda Hints, Peep Männik, Jaak Nõlvak, and Madis Rubel on a project to place the Estonian Late Ordovician-Early Silurian faunal communities within a sequence stratigraphic framework. Our goal is to compare the Estonian sections to our prior work in the Great Basin of the western United States. We have described numerous cores, and the sequence framework for the Ordovician part of the study is nearing completion.

HINTS, LINDA (Estonia). I am continuing the study of Ordovician stratigraphy and brachiopods. In co-authorship with D.A.T. Harper, a paper on the Alwynella-Grorudia group brachiopods from the East Baltic is in preparation. In 2002 revision of the taxonomy of brachiopods of the genus *Cyrtotella* was started. In collaboration with P. Brenchley, J. Marshall and colleagues from our institute, Late Ordovician events in Baltica were analysed using carbon isotope data. The results are presented in two papers submitted for publication. Together with A. Oraspold and J. Nolvak, the early Ashgillian (Pirgu Stage) deposits and stratigraphy of the East Baltic were studied and a paper is in preparation. My

colleagues and I had joint field works with P. Sheehan and M. Harris to study of the Ordovician and Silurian sequences in drill cores of Estonia. The Estonian data are compared with the sequences of the Great Basin.

HÖGSTRÖM, ANETTE (Sweden). I have just moved back to Uppsala for a new position after spending one year at the Dept. of Earth Sciences in Bristol. My Ordovician interests continuously include problematic taxa such as machaeridians, but has expanded to include problematic molluscs, especially possible chitons and the multiplacophorans.

KALJO, DIMITRI (Estonia). I'm continuing studies on the Baltic Late Ordovician carbon isotope stratigraphy and rugose coral biodiversity as reported last year. In cooperation with Heljo Heinsalu and Viive Viira et al. we are completing a paper analysing lithology, conodonts and graptolites from the Lower Tremadocian Orasoja section (NE Estonia).

KEY, JR., MARCUS M. (USA). I am currently working with Patrick Wyse Jackson (Trinity College Dublin) and Bill Patterson (Univ. of Saskatchewan) on light stable isotopes from the carbonates of the Middle Ordovician Duncannon Group in southeastern Ireland. We finally have results thanks to Bill Patterson's micromilling apparatus which allowed us to separately sample with 10 um precision the bryozoan skeletal carbonate, brachiopod skeletal carbonate, and a variety of cements, veins, and matrix. The preliminary results presented at GSA in Denver indicate these limestones have been exposed to warm diagenetic waters, and their original oxygen isotopic ratios have been reset. We hope to try similar sampling on Estonian bryozoans from Baltica which should be less altered.

KOREN', TATIANA (Russia). The main focus of my Ordovician activity is the detailed stratigraphy and graptolites in Russian part of Baltoscandia. I am compiling the biostratigraphic and taxonomic information on graptolites over the region aiming at revision of the *hirundo* level. Currently I investigate the Ordovician-Silurian boundary graptolites (the *persculptus* to *acuminatus* Zones) from boreholes in Scania. My ongoing collaborative studies in VSEGEI with Tatiana Tolmacheva and Sergei Teren'tiev include the investigation of correlative potential of the biostratigraphic markers of the main Ordovician boundaries at the Russian sections: *lunatus* -*leavis* level (Taimyr, Novaya Zemlja, Gorni Altai and Kazakhstan) and *complanatus* level (Northeastern Russia and Kazakhstan).

KOZLU, HUSEYIN (Turkey). I am actively working on the stratigraphy of the Ordovician rocks in the Taurides.

With the support of Y. Goncuoglu (Ankara) and G. Sarmiento (Madrid) on conodont biostratigraphy, I and M.C. Goncuoglu (Ankara), we are trying to reconstruct the Ordovician paleogeography in southern Turkey. With J.F. Ghiene, O. Monod and W.T. Dean we have finalized our field studies on our recent finding of latest Ordovician glacial deposits in the Taurides and submitted our results for publication.

KRAFT, JAROSLAV (Czech Republic). I have continued studies of Ordovician graptolites and stratigraphy, especially in the Bohemian Ordovician. Currently I assemble databases of the Bohemian Ordovician localities (a project of the Ministry of Culture of the Czech Republic) and graptolite species (the first part dendroids) of Bohemia together with Petr Kraft. I continue to participate in the project supported by Grant Agency of the Czech Republic on comprehensive study of the Klabava Formation (?Tremadocian-Arenigian).

KRAFT, PETR (Czech Republic). I have continued in study of Ordovician graptolites, stratigraphy and other fossils, especially from Bohemian Ordovician. I also continue as participant on assembling some databases of the Bohemian Ordovician localities (a project of the Ministry of Culture of the Czech Republic) and graptolite species (the first part on dendroids) of Bohemia together with my father Jaroslav. I am coordinator of the project supported by Grant Agency of the Czech Republic on comprehensive study of the Klabava Formation (?Tremadocian-Arenigian). I also study palaeoscolecidans and chaetognaths together with Oli Lehnert.

LEGRAND, PHILIPPE (France). 1) I am working on: Lower Ordovician graptolites of Algerian Sahara: Late Ordovician glaciation Caradocian fauna of Algerian Sahara with Algerian colleagues.

LEHNERT, OLIVER (Germany). My work on Cambro-Ordovician conodonts and associated microfossils from the dolomite successions of the southwestern Great Basin still continues. However, currently I am also focussing on conodonts from the Ordovician and Silurian as well as on some soft body worm fossils from the Barrandian area together with Petr Kraft. The work in the Silurian of the Prague Basin is combined with isotopic studies (with Jiri Kriz & Jiri Fryda, Czech Geol. Surv.; Werner Buggisch, Erlangen). Olda Fatka and I will also try to solve -in addition to the Ordovician work- some questions in the Cambrian of Bohemia. With Michel Vanguestine and Pierre Breuer (Univ. Liège) I have

been looking on the first Early Ordovician conodonts from greywackes in the Salm Group of Belgium. In cooperation with Jiri Fryda and Alex Nützel (Univ. Erlangen), molluscan faunas from my Early Palaeozoic residues (Cambrian through Silurian) will be documented. With Werner Buggisch and Martin Keller (Erlangen) a paper is in press dealing with C-isotopes in the Cambro-Ordovician succession of the Argentine Precordillera, another one with Petr Kraft on Ordovician chaetognaths and palaeoscolecidans. Publications with Godfrey Nowlan and Sandy McCracken on autochthonous conodont faunas from Cambrian-Devonian sections on Ellesmere Island (Canadian Arctic) as well as with Carmen Lee and Godfrey on allochthonous faunas from carbonate pebbles in Tertiary conglomerates, and with Chris Harrison and Godfrey on the CAI data from this area will hopefully be published this year. Together with Werner Buggisch and Michael Joachimski (Erlangen) I will start a project on oxygen isotopes from conodont phosphate combined with C-isotope studies from certain levels in the Early Palaeozoic and from different palaeolatitudes. The goal is to calculate changes in sea water temperatures especially across some extinction intervals, but also to see the gradient in sea water temperatures from equatorial regions to high latitudes. Many friends and colleagues already have sent their positive response and expressed that they are willing to cooperate.

LI JUN (China). I am working this year on Chinese acritarchs and benthic algae with Colleagues.

LI YUE (China) has begun a two-year sabbatical period at the University of Tokyo, Japan (supported by Japan Society for the Promotion of Science), working with Professor Ryo Matsumoto, on a project on the stratigraphy, sedimentology and geochemistry of the Late Ordovician mass extinction events in South China. The aim of this work is analysis of the sedimentary sequence corresponding to the bioevents. Generally, the Late Ordovician bioevents are considered as the sea-level changes. If the Late Ordovician regression hypothesis is true, the erosion amounts from low-stand uplifting areas should be considered larger than during non-glacial epoch. Controversially, the Late Ordovician sequences of Wufeng Fm. and Kuanyinchiao Bed are commonly very thin in the South China Block, e.g. the thickest sequence is generally no more than tens meters. But the time range of these two units represents four biozones (from *D. complexus* biozone to *N. persculptus* biozone) and illustrated a starved (or condensed) tract. It means that the erosion function from uplifting region is not very big. Generally, the amount of deposition during the regression epoch must be increased due to the increasing of erosion area. The transgressive Lungmachi Fm. (Uppermost Ordovician to Llandovery, Silurian)

began with an initially very condensed component (from *A. ascensus* biozone to *P. acuminatus* biozone, meters thick), followed by gradually increasing thicknesses with time (from *C. vesiculosus* biozone onward, generally more than hundreds metre). Terrigenous sedimentary amounts from erosion area did increase during the Llandovery transgression epoch, even through the erosion areas were shrunk comparing with the Latest Ordovician regression epoch. The depth of the Yangtze basin was still shallow and rapid subsidence and compensative deposition constrained the Silurian sequences. Where these large amounts of sediments come from and what is the mechanism that controlled the basin subsidence is still far from understood. Moreover, the study of lithofacies of the Hirnantian carbonate is ongoing. Thus, a comparative research of biofacies and lithofacies from different palaeoenvironmental settings will permit a more precise reconstruction of the evolution procession of the ocean environment during the Ordovician/Silurian interval.

LENZ, ALFRED (Canada) and DENNIS JACKSON (U.K.) have completed their ongoing studies of Tremadoc graptolites from northern Yukon, Canada. The paper is to be published in Geological Magazine.

LÖFGREN, ANITA (Sweden). I am continuing research on Lower and Middle Ordovician conodont faunas and biostratigraphy, mainly from Sweden. Currently I have two taxonomical papers in press (one with T. Tolmacheva and one with Zhang Jianhua), and two stratigraphical papers on the lower Middle Ordovician are, respectively, in review and in preparation.

MCCRACKEN, SANDY A.D. (Canada). I continue to work on Middle to Upper Ordovician, Silurian, and Devonian conodonts from various locations in Canada. A GSC website with images from the GSC photos archives was created. [<http://www.nrcan.gc.ca/gsc/calgary/paleogallery/>]

MÁNGANO, MARÍA GABRIELA (Argentina). A significant part of my research projects concentrates on the ichnology of Cambrian-Ordovician clastic successions of northwest Argentina. Trace fossils are extremely abundant in these deposits. Although the trace fossils have been mentioned in numerous papers, there are few studies documenting paleoenvironmental, paleoecological and paleobiological aspects of these ichnofaunas, topics that I am trying to explore. At present, I am making progress on the study of Late Cambrian-Tremadocian sedimentary facies, sequence stratigraphy and ichnofaunas. A paper with Mary Droser on

ichnological aspects of the Ordovician radiation is included as part of the book on the Ordovician Biodiversification Event (IGCP-410).

MÄNNIK, PEEP (Estonia). I am actively working on the evolution, ecology and taxonomy of Ordovician and Silurian conodonts from Baltic, Arctic regions and Siberia, and on conodont-based high-resolution stratigraphy. Several joint studies (composition, distribution and evolution of Silurian conodont faunas with L. Jeppsson from Lund University; "Collaborative research: comparing Upper Ordovician-Lower Silurian carbonate platform in Estonia and Great Basin: a test of the synchrony of sequences and faunal changes" – with Mark T. Harris from the Wisconsin-Milwaukee University and Peter M. Sheehan from the Milwaukee Public Museum; evolution and high-resolution stratigraphy of the Early Palaeozoic sedimentary basins in northern Baltica and Siberia palaeocontinents – with colleagues from Lund, Vilnius, StPetersburg, Syktyvkar, Ukhta and Novosibirsk; taxonomy, distribution and evolution of Walliserodus - with James E. Barrick from Texas Tech University; integrated conodont and graptolite stratigraphy - with David Loydell from Portsmouth University, etc.) are going on.

MEISEL, SÖREN (Germany). I currently catch up my collection of 'weak' metamorphosed Upper Ordovician rocks from the Himalaya, sampled in the Thak Khola region, central-west Nepal, during the ZOOlogical Geological EXpedition ZOOLOGEX-02 undertaken in 2002. Work encompasses sedimentological and microfacies analyses, respectively, and shall become completed by palaeontological investigation in the near future. Beyond it, investigation of the Upper Ordovician of central-south Germany, e.g. the deciphering of the distribution of pebbles in the glacio-marine Lederschiefer Formation, is going on. At the end of 2003, I plan to visit some outcrops in the Late Ordovician successions of western Europe and northern Africa in order to log them at higher stratigraphic resolutions. That's all.

MELNIKOV, SERGEY V. (Russia). I'm actively working on the Ordovician and Silurian stratigraphy and Conodonts of the Timan-Pechora region (NE of the European part of Russia).

MIKULÁS, RADEK (Czech Republic). I am currently working on trace fossils and ichnofabrics across the Volkhov depositional sequence (Ordovician, Arenig of St. Petersburg Region, Russia; joint project with Andrei Dronov) and on ichnofabric patterns of the Ordovician of the Barrandian area (several minor papers in press).

NOLVAK, JAAK (Estonia). I continue working on Ordovician chitinozoans and biostratigraphy from Baltoscandian sections with my Estonian colleagues, focusing in 2003 more to chitinozoan taxonomy. Our cooperation with Y. Grahn (Rio de Janeiro), Z. Modlinski and B. Szymanski (Warszawa), M. Harris and P. Sheehan (Milwaukee) and D. Goldman (Dayton) will continue.

NOWLAN, GODFREY S. (Canada). I am facing a change of career for 2003 because I have been asked to head up a geoscience outreach program in northern Canada. Therefore my contribution to the Ordovician world is going to be severely curtailed. I am going to try and sustain the following activities: 1, Conodont biostratigraphy and biofacies related to neodymium and carbon isotope signatures and Samarium/Neodymium ratios (with Chris Holmden and Kerrie Fanton, University of Saskatchewan and Fran Haidl, Saskatchewan Geological Survey) with the objective of tracking sea level on the North American craton during the Middle to Late Ordovician. The work has been extended to a new subsurface section in Saskatchewan; 2, Ordovician-Silurian rocky shoreline section on Hudson Bay near Churchill, Manitoba (with Bob Elias and Graham Young). This study involves detailed biostratigraphy as an aid to mapping the rocky shoreline; 3, Working jointly with Oliver Lehnert (University of Erlangen) on a study of clasts in a Tertiary conglomerate on eastern Ellesmere Island; 4, Conodont biostratigraphy of Cambrian to Silurian strata of eastern Ellesmere Island in support of geological mapping by K. Dewing and U. Mayr. I

ORTEGA, GLADYS (Argentina). I am working on Early Ordovician graptolite fauna from Eastern Cordillera and the Famatina System of NW Argentina, and I continue studying Early, Middle and Late Ordovician graptolites from the Argentine Precordillera. I also continue studies together with Guillermo Albanesi on a long term project trying to assemble a conodont-graptolite biostratigraphic scheme for the Ordovician System of Argentina. Currently, together with several Argentine colleagues I am involved in the organization of the 7th International Graptolite Conference, to be held in San Juan City, Argentina, in August 2003 (see the web site for further information: <http://www.cricyt.edu.ar/2003.htm>).

OWEN, ALAN (UK). Biodiversity change remains a major focus of my Ordovician activities, in particular the analysis of the faunas of the British Isles. Work also continues (albeit slowly) on Ordovician trilobites from Ireland including those from terranes in the Iapetus Suture Zone (with Mike Romano). I am also

finishing a project on the geochemistry of cherts in the Scottish Highland Border Complex and its significance in terms of terrane history (with Howard Armstrong and Geoff Tanner). As for my research students: Alison Bowdler-Hicks has submitted her PhD thesis on the trinucleid trilobite Family Marrolothinae, Sarah Stewart continues to investigate a wide range of obscure and neglected components in the Ordovician faunas of the Girvan district, S.W. Scotland and Kathy Keefe is completing her MSc work on aspects of the taxonomy and palaeogeographical origins of the Ashgill trilobites from Girvan.

PANKHURST, ROBERT J. (UK). I am actively working on the Paleozoic magmatic and metamorphic evolution of southernmost South America. I am co-leader of IGCP 436 (Pacific Margin of Gondwana), which will hold its final meeting at X Chilean Geological Congress, Concepcion, Chile, 6-10 October 2003.

PERCIVAL, IAN (Australia). I have continued a very active interest in Ordovician conodonts from New South Wales in 2002, concentrating on those of Early Ordovician age from the Koonenberry Belt in the far-western part of the state (a monograph-size manuscript on this fauna, with co-authors Yongyi Zhen and Barry Webby, has been accepted for Records of the Australian Museum). The other area of focus has been the Ordovician of the Lachlan Fold Belt in central and southern New South Wales, where conodonts occur in cherts associated with deep-water turbiditic successions. Early Ordovician conodonts have recently been recognised for the first time in this region, and will be documented in several short papers currently in preparation (one for the 9th ISOS this year in Argentina). A paper discussing a small but biostratigraphically significant fauna from cherts of the Jindalee Group (Lyons and Percival) was published late in 2002. Work commenced during the year on a project with Richard Glen (NSW Geological Survey) and Ian Stewart (Monash University) to complete remapping of the exotic Narooma Terrane (far south coast of New South Wales) using Late Cambrian to Early Ordovician conodonts in cherts to constrain the stratigraphy. At the First International Palaeontological Congress at Macquarie University in July 2002, I presented (on behalf of my colleague Dr Zhen) a paper reconsidering existing models of Ordovician conodont biogeography; the manuscript is currently being revised after review. A poster presented at the IPC in collaboration with Zhen and J. Farrell (Macquarie University) was subsequently submitted as a paper to Proceedings of the Linnean Society of New South Wales, and will be published in early 2003; it deals with Late Ordovician conodonts and brachiopods recovered from allochthonous limestones enclosed within Late Silurian sediments. Finally, I have

been assisting Barry Webby throughout 2002 in editing "The Great Ordovician Biodiversification Event" to be published by Columbia University Press. It has been another busy year.

PIÇARRA, JOSÉ (Portugal). I'm actively working on the lower Paleozoic stratigraphy of the South Portugal (Ossa Morena Zone), and also in Silurian graptolites from Portugal and French Armorican Massif.

PODHALAŃSKA, TERESA (Poland). I am actively working on the Upper Ordovician and Lower Silurian stratigraphy and sedimentology as well as graptolites from near the Ordovician/Silurian boundary zone.

MIKULÁŠ, RADEK (Czech Republic). I am currently working on trace fossils and ichnofabrics across the Volkhov depositional sequence (Ordovician, Arenig of St. Petersburg Region, Russia; joint project with Andrei Dronov) and on ichnofabric patterns of the Ordovician of the Barrandian area (several minor papers in press).

REPETSKI, JOHN E. (USA). Currently I am still working chiefly on biostratigraphy, CAI, biogeography, and systematics of Ordovician and Cambrian conodont faunas, with some work on other phosphatic problematica and some faunas of other ages. In the Appalachian basin, I am preparing Ordovician and Devonian thermal maturation (CAI and %Ro) maps for states in the central part of the basin, studying Late Cambrian through Ibebian shelf to slope faunas across Virginia, Maryland, and Pennsylvania (with J. Taylor, and D. Brezinski), trying to unravel the history of the Hamburg klippe terrane in E. Penna. (w/Bob Ganis), and age-dating metamorphosed sedimentary units in Vermont to support mapping there. I am still working on Ibebian faunas in western US (w/J. Taylor, J. Loch, R. Ethington, & P. Myrow) and in Sonora, Mexico. I continue providing age-dating support for projects in the US Midcontinent, Alaska, and elsewhere. Finally, I am working on several taxonomic projects, mostly on Lower and Middle Ordovician conodonts, mostly with various colleagues.

ROBARDET MICHEL (USA). I have been working 1) on the Lower Paleozoic (mainly Ordovician) of the "Castilian branch" of the Iberian Cordillera (NE Spain), within a Spanish Research Project led by J.C. Gutiérrez-Marco (Madrid, Spain). 2) on the Ordovician transition in the SE Armorican Massif of western France, with J.M. Piçarra (Beja, Portugal) and F. Paris (Rennes, France). A recent artificial section shows the uppermost part of the Ordovician (clast-bearing glaciomarine deposits with

chitinozoans) and the lower and middle parts of the Llandovery (graptolitic black cherts ("phtanites"), from the base of the Rhuddanian up to the lower part of the Telychian (see publication Piçarra et al. 2002). 3) on two chapters of the book "Geology of Spain" published by the Geological Society of London: Chapter 4 Ordovician with J.C. Gutiérrez-Marco and other colleagues from Madrid (see publication Gutiérrez-Marco et al. 2002); Chapter 5 Silurian (see Robardet and Gutiérrez-Marco 2002). 4) on a publication that proposes an alternative approach to the Variscan Belt of southwestern Europe, based on the pre-orogenic paleogeographical constraints, many of them concerning the Ordovician (see Robardet 2002).

RONG, JIA-YU (China). I have been studying a well-preserved, silicified brachiopod fauna from the Kunitan Formation (mid-upper Darriwilian, Middle Ordovician) at Wudang, Guiyang, central Guizhou, Southwest China with David Harper, Zhan Ren-bin and other colleagues. Have studied *Holorhynchus* brachiopod fauna from the Badajilin Formation (mainly mid Ashgill, Upper Ordovician), Ejin, western Inner Mongolia with Zhan Ren-bin and Jin Jisuo. Additional interest is the mass extinction of the Ordovician brachiopods.

SÁNCHEZ, TERESA M. S. (Argentina). I am continuing research on Ordovician bivalves and rostroconchs from Argentina. My current work is focused on taxonomy of Tremadoc and Arenig bivalves from the thick and continuous successions of the Central Andean basin (Cordillera Oriental, NW Argentina). The aim of these studies is help to understand the early stages in the evolution of such bivalve clades as Cycloconchoidea and Anomalodesmata in the context of the early Ordovician radiation on the temperate to cold water Gondwana shelves. Together B. Waisfeld and M. Carrera I am working on Gondwanan diversification events compared with global Ordovician trends.

SANSOM, IVAN J. (UK). Work is continuing on the diversity, distribution and ecology of Laurentian ostracoderm faunas (together with M. Paul Smith, David Elliott, Stephen Leslie and others), and the next phase in the project is to look at ostracoderms from Gondwana, particularly Australia (together with Alex Ritchie, Bob Nicoll and Carole Burrow) and Argentina (with Susana Heredia and Guillermo Albanesi).

SARMIENTO, GRACIELA N. (Spain). I'm actively working on Ordovician and Silurian conodonts from the Iberian Peninsula, Morocco and Turkey.

SCHMITZ, BIRGER (USA). I am actively working on the meteorite rain to Earth in connection with the disruption

of the L chondrite parent body in the asteroid belt c. 480 Ma.

SENNIKOV, NIKOLAI V. (Russia). I am actively working on the problems: 1) zonal biostratigraphy by graptolites, conodonts and chitinozoans; 2) paleogeography and geodynamics.

SERVAIS, THOMAS (France). My research activities are still concentrated on Ordovician acritarchs. Projects concern the Ordovician of China, in collaboration with Li Jun (Nanjing), and sections in North Africa, including Algeria and Morocco. In terms of biostratigraphy, the research is focused on the Cambrian/Ordovician boundary and the succeeding stage boundaries (Tremadocian-stage 2; stage 2-3, stage 3-Darriwilian). Together with José-Javier Alvaro and Alain Blicek (Lille), I co-edited a special issue of *Palaeogeography, Palaeoclimatology, Palaeoecology* that includes a series of articles related to Lower Palaeozoic palaeo-(bio)geographies, based on the results of discussion during the palaeogeography meeting held at Lille in September 2001. This special issue should be published in 2003. Currently, a special issue in the *Review of Palaeobotany and Palynology*, serving as the proceedings volume of the CIMP (Commission Internationale de Microflore du Paléozoïque) congress in September 2002 at Lille, is prepared together with Charles Wellman (Sheffield). This special issue will include a series of papers on Ordovician acritarchs and chitinozoans. In October 2003, together with Axel Munneke (Erlangen), Peter Sheehan (Milwaukee) and others, we plan to apply for a new IGCP project that somewhat succeeds to the extremely successful project 410 (see also elsewhere in the newsletter).

TAYLOR, JOHN F. (USA). I have several ongoing projects that deal with Lower Ordovician faunas and stratigraphy in Laurentian North America. Fellow trilobitologist Jim Loch (Central Missouri State University) and I are making significant progress in sampling the El Paso Group in the southwestern USA (Texas and New Mexico) to provide a least a coarse biostratigraphic framework for reconstruction of the depositional history of the lower part (Skullrockian and Stairsian Stages) of the thick carbonate platform succession in that region. Our partners in that venture are Paul Myrow (Colorado College), who serves as the sedimentologist, and Rob Ripperdan (University of Puerto Rico Mayaguez) who is doing the Carbon isotope stratigraphy. Ray Ethington (University of Missouri) and John Repetski (U.S. Geological Survey) are processing a prodigious number of conodont samples to provide critical, additional

biostratigraphic control. Rob, Paul, and I are also nearing completion of a multi-year study of the uppermost Cambrian and Lower Ordovician of the northern Rocky Mountains (Wyoming and Montana) -- also with considerable data from Ray Ethington and Jim Miller (Southwest Missouri State). Farther east, I am working with Tony Runkel of the Minnesota Geological Survey on Lower Ordovician faunas in the Oneota Dolomite. Even closer to home, I continue to push forward on description of the Lower Ordovician trilobites of the Stonehenge Limestone and its eastern equivalents (e.g. the Grove Formation in Maryland).

TEREN'TIEV, SERGEI (Russia). Since this January I am a postgraduate student in VSEGEI working on detailed biostratigraphy, biofacies and correlative potential of bioevents of the Middle and Upper Ordovician carbonate successions in Baltic- Ladoga Glint (north-western Russia).

TOLMACHEVA, TATIANA (Russia). Recently I have moved back to St.-Petersburg, VSEGEI to continue the work on conodont biostratigraphy and biofacies from the Lower and Middle Ordovician of east Baltic. My work on the taxonomy of some Lower Ordovician conodonts from cherty sections of Central Kazakhstan is continued and I am also involved into the project on systematic description of Ordovician macro- and microfauna from Taimyr.

VANDENBROUCKE, THIJS (Belgium). I am continuing my PhD project on chitinozoans and have recently finished working on the Swedish Fågelsång section, the new GSSP for the base of the Upper Ordovician Series. Currently, I am working on the chitinozoans from its British time equivalent section in the Shelve Inlier (Welsh Borderland), and from the type "Ashgill" area in the Cautley District (Northern England), the latter in co-operation with B. Rickards. I also hope to be able to have a look at chitinozoans from the newly proposed GSSP's for the base of "Stage 6". Other sections to be studied this year (or at least in the near future) include the Whitland Section (Wales), the Hartfell Score (Scotland) and a section along the Cardigan coast (Wales), all of "Caradoc" age.

VANMEIRHAEGHE, JAN (Belgium). In October 2002, I have started my Ph. D project on the mid-Ordovician to Silurian basin development at the northern edge of the Midlands Microcraton (Cendro – Brabant – East Anglia). My supervisor is Dr. Jacques Verniers. In the first place, this work will focus on the litho- and biostratigraphy with chitinozoans of the Cendro Inlier, one of the least investigated lower Palaeozoic areas of Belgium. By means of fieldwork and data from literature, four more or less parallel, N-S directed

transects will be constructed in a later phase, cutting through the Condruz Inlier and the Brabant Massif (Belgium), East Anglia and the Midlands Microcraton. Merging these data will lead to the reconstruction in time and space of the depositional environment of the study area. Together with Dr. Verniers, I recently finished a manuscript that dealt with the litho- and biostratigraphy (with chitinozoans) of two Ashgill ("stage 6") formations in the western part of the Condruz Inlier, in the Puagne area. Two conglomeratic levels in the upper formation may be associated with the sea-level drop, caused by the Hirnantian glaciation. In the same paper, two new chitinozoan species are defined.

VERNIERS, JACQUES (Belgium). The past year saw the outcome of many publications at the end of the EUROPROBE (TESZ and PACE TMR network) project, which also bears light on the Ordovician plate tectonic history. In 2003 we will concentrate on a restudy of the chitinozoans of the Dob's Linn section, which was resampled by us in October 2002 with the help of Euan Clarkson. We will also look at the chitinozoans from samples taken from the slabs with graptolites collected at Dob's Linn, studied by Williams and kindly provided by Mike Melchin. This calibration of the chitinozoan biozonation with the graptolite biozonation through the Hirnantian glaciation and around the Silurian-Ordovician boundary will allow to date more in detail the recently discovered coarser sediments in the Condruz inlier in Belgium. The latter unit is tentatively interpreted as the reflection of the Hirnantian sea level drop (see work of Jan Vanmeirhaeghe).

VIIRA, VIIVE (Estonia). I continue to work on Ordovician and Silurian conodonts. The completion of the manuscript on conodonts from the Caradoc kuckersite (oil shale) deposits of Kohla, Estonia (with Richard Aldridge and Stephanie Barrett) is in progress. The study on conodonts from the Lower Arenig glauconitic sand of Pakri, Estonia (with Anita Lofgren) is continuing.

WANG, XIAOFENG (China). I am continually working on the Lower - Middle Ordovician boundary and the Ordovician-Silurian boundary around the Yangtze Gorges area, China together with my Ordovician group, consisting of Chen Xiaohong (chitinozoan), Wang Chuanshang (graptolite), Li Zhihong (conodont), Zhou Zhiqian (trilobite) and Zeng Qingluan (brachiopod). Besides, I am leading a group working a project on palaeo-continental reconstruction of China and its reflection of litho-, bio-, sequence- and event-stratigraphy. The project started in 2000 and will be finished in 2004. The

manuscript regarding the Huanghuachang section is nearly finished. Its abstract is recorded below. Any comments and criticisms on it are welcome.

WHEELLEY, JAMES R. (U.K.). I have recently started my PhD under the supervision of Dr. Lesley Cherns and Professor Paul Wright at Cardiff University. My project is concerned with the taphonomy and sedimentology of Ordovician carbonates. The aim of this research is to reassess the role of early aragonite dissolution in relation to early diagenesis and the nature of the fossil record. I have begun by studying the Llanvirn, Caradoc and Ashgill limestones of South Wales. In the summer of 2003 work begins on the Ordovician limestones of Jämtland, Sweden.

WICANDER, REED (USA). I am continuing my acritarch work on various Ordovician formations. I plan to submit this year a manuscript on the acritarchs of the Upper Ordovician Bill's Creek and Stonington formations, Michigan, USA in collaboration with Dr. Geoffrey Playford. A paper titled "Paleogeographic and biodiversification trends of Ordovician acritarch assemblages from Laurentia" was submitted as part of a special symposium honoring Dr. Geoffrey Playford at the 2002 International Palynologic Congress, Sydney, Australia.

YOUNG, GRAHAM (Canada). I am continuing to work on Paleozoic paleoecology, and on coral diversity and distribution before and after the Late Ordovician extinction event. Collaborations with Bob Elias examine diversity, community structure, and morphology of coral faunas; a section on corals of Laurentia is in press in the book on Ordovician Biodiversification, IGCP Project 410. A large field project with Bob, Dave Rudkin, Godfrey Nowlan, and others assesses paleoenvironments around a unique Late Ordovician-Early Silurian archipelago in the Churchill area, northern Manitoba. We anticipate completing fieldwork for this project in 2003. A paper on Late Ordovician giant trilobites from this region was published in the *Journal of Paleontology* 77(1), 2003. I am collaborating with Stephen Kershaw (Brunel University England) on paleobiology of Paleozoic corals and stromatoporoids. A recently submitted manuscript establishes a classification system for growth banding and related features, through a comparison of Ordovician material from Manitoba and Silurian fossils from Gotland, Sweden.

ZHAN, REN-BIN (CHINA). Since 2000, I have been working on Ordovician radiation of brachiopods of China. Because those Middle Ordovician brachiopods of China have never been systematically studied, I am now spending most of my time on Middle Ordovician brachiopods of South China, from one region to another,

from early Middle Ordovician to late Middle Ordovician, and from one brachiopod fauna to another. Together with my colleagues of our research group, I have already visited 9 Middle Ordovician sections in South China and collected thousands and thousands of shelly and graptolitic fossils. Indoor study is now going on. Besides, I am also doing a little research on the end-Ordovician mass extinction and the recovery afterward in the earliest Silurian together with Prof. Rong Jia-yu.

ZHANG, YUANDONG (China). I am continuing to work on: 1) the Tremadoc biostratigraphy and graptolites of China, in cooperation with Prof. B.-D. Erdtmann in Technical University of Berlin. A paper on the revision of Tremadoc graptolite zonation of China has been delivered, and at the same time a description of some late Tremadoc graptolites from Dayangcha section, Jilin, China, is finished and submitted. 2) the bioradiation event of early-middle Ordovician in South China, with Prof. Zhou Zhi-yi, Dr. Zhan Ren-bin and others in NIGP, China. Based mainly on a study of the graptolites collected in the past few years and those stored in NIGPAS, a revised graptolite sequence for Yangtze Platform with a correlation to other continents is being suggested. A paper on the different biodiversity patterns of Yangtze Platform and Jiangnan Slope of China will be finished soon. 3) In Jan. of 2003, we (together with Dr. Fan Jun-xuan and Prof. Dr. B.-D. Erdtmann) had a field excursion to Yunnan of China, to investigate the Ordovician System of South China Plate (Kunming in E. Yunnan), Indo-China Plate (Dali in Central Yunnan) and Sibumasu (Baoshan and Shidian in W. Yunnan), and collect graptolite specimens. The Ordovician sequence of West Yunnan shows magnificent differences from that of South China, and is believed by Prof. Erdtmann to be remarkably similar to central Europe. 4) the phylogenetic origin of earliest biserial graptolites, in collaboration with Prof. R.A. Fortey. 5) the GSSP work on the bases of Middle Ordovician and Ashgill Stage, in collaboration with Prof. Chen Xu and Dr. Zhan Renbin and Dr. Fan Jun-xuan.

ZHOU, ZHIYI (China). I am still working on the Ordovician trilobite biofacies of the Yangtze Block. Last year my field-work was mainly carried out in the Lower Yangtze area in Anhui and Zhejiang provinces. Relative researches involve a review of the previously established trilobite genera and faunal sequences, and the stratigraphic correlation between different facies belts. Other work includes studies on the Llanvirn-early Ashgill trilobite faunas of Pagoda facies from the Yangtze region (with Zhou, Zhiqiang) and on the ontogeny of Arenig trilobites from Anhui

(with Yuan, Wenwei). I have spent more than ten years to work with my colleagues on the Phanerozoic biostratigraphy (Zhou & Chen, 1992: Biostratigraphy and Geological Evolution of Tarim. Science Press, Beijing) and geology (Zhou & Dean, 1996: Phanerozoic Geology of Northwest China. Science Press, Beijing) of the Tarim Block and its neighbored regions. In the recent several years, we focused our attention to the stratigraphy of the vast hinterland of the Tarim Basin. This led to an extensive and intensive study of more than 30 subsurface borehole sections. Yet, a complete sequence of fossils has been established, and a unified classification and accurate correlation of different facies types of strata from both subsurface and peripheral areas of the basin have been accomplished. Thanks to the efforts of my colleagues and cooperators, the new scientific report was completed in 2000 and was subsequently published by the Science Press in the last year.

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NAMES AND ADDRESS CHANGES

Florencio G. ACEÑOLAZA
INSUGEO
Universidad Nacional de Tucumán
Miguel Lillo 205
4000 San Miguel de Tucumán
ARGENTINA
Tel.: +54-(0)381-4352767
Fax: +54-(0)381-4352767
E-mail: 1) insugeo@unt.edu.ar
2) facenola@satlink.com

Guillermo F. ACEÑOLAZA
INSUGEO
Universidad Nacional de Tucumán
Miguel Lillo 205
4000 San Miguel de Tucumán
ARGENTINA
Tel.: +54-(0)381-4352767
Fax: +54-(0)381-4352767
E-mail: acecha@unt.edu.ar

Aïcha ACHAB
INRS-Eau, Terre et Environnement
Case postale 7500
Sainte-Foy, Québec, G1V 4C7
CANADA
Fax: 418- 654-2615
E-mail: aachab@nrcan.gc.ca

Leho AINSAAR
Institute of Geology
University of Tartu
Vanemuise 46, Tartu 51014
ESTONIA
Tel.: (+372) 7375 834
Fax: (+372) 7375 836
E-mail: lainsaar@ut.ee

Guillermo L. ALBANESI
CONICET - Museo de Paleontología
Universidad Nacional de Córdoba
Casilla de Correo 1598
5000 Córdoba
ARGENTINA
Tel.: +54-(0)351-4718655
Fax.: +54-(0)351-4216350
E-mail: 1) galbanesi@arnet.com.ar
2) galbanes@com.uncor.edu

Richard J. ALDRIDGE
Department of Geology
The University
Leicester LE1 7RH
UK
Tel.: 0116 252 3610
Fax: 0116 252 3918

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E-mail: ra12@leicester.ac.uk
URL: <http://www.le.ac.uk/geology>

José Javier ÁLVARO BLASCO
UPRESA 8014
"Paléontologie et Paléogéographie du Paléozoïque"
Bât. SN5, Cité Scientifique
Université de Lille I
59655-Villeneuve d'Ascq.
FRANCE
Tel.: +33 (0) 3 20 33 63 92
Fax: +33 (0) 3 20 43 69 00
E-mail: Jose-Javier.Alvaro@univ-lille1.fr
URL: http://www.univ-lille1.fr/geosciences/page_ufr/upresa_8014/upresa_8014.html

Anna I. ANTOSHKINA
Institute of Geology, Komi Science Centre, Ural
Division, Russian Academy of Sciences
54 Pervomaiskaya st.
167982, Komi Republic
Syktyvkar
RUSSIA
Tel.: (8212) 425353
Fax: (8212) 425346
E-mail: Antoshkina@geo.komisc.ru

Howard A. ARMSTRONG
Department of Geological Sciences
The University, South Road
Durham DH1 3LE
UK
Tel.: 0044191 3744780
Fax: 00441913742510
E-mail: H.A.Armstrong@durham.ac.uk

Esther ASSELIN
Natural Resources Canada
Geological Survey of Canada, GSC- Québec
880 chemin Sainte-Foy, Suite 840
Québec, Québec, G1S 2L2
CANADA
Fax: 418- 654-2615
E-mail: easselin@nrcan.gc.ca

Ricardo A. ASTINI
Estratigrafía y Geología Historica
Universidad Nacional de Cordoba
Av. Velez Sarsfield 299, C.C. 395
5000 Cordoba
ARGENTINA
Tel.: (54) 3543-433238
Fax: (54) 351-4332097
E-mail: raastini@com.uncor.edu

Gabriella BAGNOLI

Dipartimento di Scienze della Terra
Via S. Maria, 53
56100 Pisa
ITALY
Tel.: +39 050 49643
Fax: + 39 050 500932
E-mail: bagnoli@dst.unipi.it

Christopher R. BARNES
School for Earth and Ocean Sciences (SEOS)
and Centre for Earth and Ocean Research (CEOR)
University of Victoria
Victoria, British Columbia, V8W 3P6
CANADA
Tel.: (250) 721-6120
Fax: (250) 721-6200
URL: <http://www.uvic.ca/seos>

Michael G. BASSETT
Department of Geology
National Museum & Gallery
Cathays Park
Cardiff CF10 3NP
Wales
UK
Tel: +44 (0)29 2057 3212 (Direct),
+44 (0)29 2039 7951 (Switchboard)
Fax: +44 (0)29 2066 7332
E-mail: Mike.Bassett@nmgw.ac.uk

Richard A. BATCHELOR
rab@st-and.ac.uk

Jeff BAUER
Department of Natural Sciences
Shawnee State University
940 Second Street
Portsmouth, Ohio 45662
USA
Tel.: 740-351-3421
Fax: None
E-mail: jbauer@shawnee.edu

Wieslaw Stanislaw BEDNARCZYK
Twarda str. 51/55
00-818 Warszawa
POLAND
Tel.: (48 33) 6978803
Fax: (48 33) 6206223
E-mail: wbednarc@twarda.pan.pl

Juan L. BENEDETTO
Cátedra de Estratigrafía y Geología Histórica
Fac. Cs. Ex., Fís. y Nat., Univ. Nac. Córdoba
Vélez Sársfield 299
5000 Córdoba

ARGENTINA
Tel.: +54-0351-4332100
E-mail: jbenedetto@arnet.com.ar

Matilde Sylvia BERESI
CRICYT-IANIGLA
Av. Ruiz Leal s/n
5500 Mendoza
ARGENTINA
Tel.: +54-0261-4287029
Fax: +54-0261-285940
E-mail: mberesi@lab.cricyt.edu.ar
URL: <http://www.cricyt.edu.ar>

Stig M. BERGSTRÖM
Department of Geological Sciences
The Ohio State University
155 S. Oval Mall
Columbus, OH 43210-1397
USA
Tel.: (614) 292-4473 (office)
(614) 457-2588 (home)
Fax: 614-292-1496
E-mail: stig@geology.ohio-state.edu

Alain BLIECK
Université des Sciences et Technologies de Lille
Sciences de la Terre
Laboratoire de Paléontologie et Paléogéographie du
Paléozoïque UMR 8014 et FR 1818 du C.N.R.S.
F-59655 Villeneuve d'Ascq Cedex
FRANCE
Tel.: +33 (0) 320 434 140
Fax.: +33 (0) 320 436 900
E-mail: Alain.Blieck@univ-lille1.fr
http://www.univ-lille1.fr/geosciences/page_ufr/cnrs_2/umr_lp3.html

Ol'ga K. BOGOLEPOVA
EUROPROBE/Historical Geology & Palaeontology
Department of Earth Sciences
Uppsala University
Norbyvagen 22
SE-752 36 Uppsala
SWEDEN
Tel. +46 18 471 27 48; +46 18 24 85 78 (home)
Fax. +46 18 471 27 49
<http://www.sedimentology.geo.uu.se/palaeo.Personnel/pages/Olga.html>

W. Douglas BOYCE
Government of Newfoundland and Labrador
Department of Mines and Energy
Geological Survey Division
Regional Geology Section
P.O. Box 8700

St. John's, NF, A1B 4J6
CANADA
Tel.: (709) 729-2163
Fax: (709) 729-4270
E-mail: wdb@zeppo.geosurv.gov.nf.ca
<http://spnhc.geo.ucalgary.ca/documents/fossilprotection.htm>,
<http://www.geosurv.gov.nf.ca/mapping/boyce.html>
<http://www.geosurv.gov.nf.ca/education/fossils/>
http://www.canadianrockhound.com/summer97/cr9701301_nfld.html

Rainer BROCKE
Forschungsinstitut Senckenberg Paläobotanik
Senckenberganlage 25
D-60325 Frankfurt am Main
GERMANY
Tel.: 0049/(0)69-97075-162
Fax: 0049/(0)69-97075-137
E-mail: rbrocke@sngkw.uni-frankfurt.de

Edsel Daniel BRUSSA
Cátedra de Paleontología I
Facultad de Ciencias Exactas y Naturales
Universidad Nacional de La Pampa
Uruguay 151
6300 Santa Rosa, La Pampa
ARGENTINA
Tel.: +54-(0)2954-436787 (int. 13-14)
Fax: +54-(0)2954-432679
E-mail: ebrussa@cpenet.com.ar

David L. BRUTON
Paleontologisk Museum
Box 1172 Blindern
0318 Oslo
NORWAY
Tel.: (47) 22-85-16-68
Fax: (47) 22-85-18-10
E-mail: d.l.bruton@nhm.uio.no

Luis Alberto BUATOIS
INSUGEO
Casilla de Correo 1
4000 San Miguel de Tucumán
ARGENTINA
Tel.: +54-381-4253053
Fax: +54-381-4253053
E-mail: ichnolog@infovia.com.ar

Petr BUDIL
Czech Geological Survey
Klarov 3, 11821, Praha 1
CZECH REPUBLIC
Tel.: +420-2-24002424
Fax: +420-2-57320438

E-mail: budil@cgu.cz
URL: <http://www.cgu.cz/pages/budil/index.html>

Marcelo G. CARRERA
Cátedra de Estratigrafía y Geología Histórica
Facultad de Ciencias Exactas, Físicas y Naturales
Universidad Nacional de Córdoba
Av. Vélez Sarsfield 299
5000 Córdoba
ARGENTINA
Tel.: +54-(0)351-4332098
Fax: +54-(0)351-4332097
E-mail: mcarrera@com.uncor.edu

Norma CECH
Cátedra de Estratigrafía y Geología Histórica
Facultad de Ciencias Exactas, Físicas y Naturales
Universidad Nacional de Córdoba
Av. Vélez Sársfield 299
5000 Córdoba
ARGENTINA
Te: 0054-(0)351-4332100 ext 25
E-mail: ncech@com.uncor.edu

Xu CHEN
Laboratory of Palaeobiology & Stratigraphy
Nanjing Institute of Geology & Palaeontology,
Academia Sinica
39 East Beijing Road, Nanjing,
P.R. CHINA
Tel.: 0086-25-3375157 (Office)
Fax.: 0086-25-7713239 (home)
E-mail: xuchen@jlonline.com

Duck K. CHOI
Department of Geological Sciences
Seoul National University
Seoul 151-742
KOREA
Tel.: +82-2-880-6737
Fax: +82-2-876-9798
E-mail: dkchoi@snu.ac.kr

Carlos Alberto CINGOLANI
Centro de Investigaciones Geológicas
Calle 1 n. 644
1900 La Plata
ARGENTINA
Tel.: +54-221-4215677
Fax: +54-221-4215677
E-mail: 1) ccingolani@cig.museo.unlp.edu.ar
2) cingola@museo.fcnym.unlp.edu.ar
3) cingola@cadema.com.ar

L. R. M. (Robin) COCKS
Department of Palaeontology

The Natural History Museum
Cromwell Road, London SW7 5BD
UK
Tel.: (44) 20 7942 5140
Fax: (44) 20 7942 5546
E-mail: r.cocks@nhm.ac.uk

Beatriz COIRA
Azorín 130
Casilla de Correo 258
4600 S.S. de Jujuy
ARGENTINA
Tel.: 54-388-4223057/4221593
Fax: 54-388-4232957
E-mail: bcoira@idgym.unju.edu.ar

Roger A. COOPER
Institute of Geological and Nuclear Sciences
PO Box 30368, Lower Hutt
NEW ZEALAND
Tel.: NZ (4) 5704853
Fax: NZ (4) 5704600
E-mail: r.cooper@gns.cri.nz

John C.W. COPE
Department of Earth Sciences
Cardiff University
PO Box 914 Cardiff CF10 3YE
UK
Tel: +44 (0)29 2087 4327
Fax: +44 (0)29 2087 4326
E-mail: john.cope@nmgw.ac.uk

Paul COPPER
Laurentian University
Sudbury, P3E 2C6
CANADA
E-mail: pcopper@nickel.laurentian.ca

Alfredo José CUERDA
Departamento Científico de Geología
Museo de La Plata
Paseo del Bosque
1900 La Plata
ARGENTINA
Tel.: +54-(0)221-4234919
E-mail: acuerda@museo.fcnym.unlp.edu.ar
Richard Arnold DAVIS
College of Mount St. Joseph
5701 Delhi Road
Cincinnati
Ohio 45233-1670
USA
Tel.: (513) 244-4699
E-mail: r_a_davis@mail.msje.edu

Oleg DOLGOV
St. Petersburg State University
Dept. of Paleontology
29, 16 Liniya
199178 St. Petersburg
RUSSIA
Tel.: +7(812) 346-1129
Fax: +7(812) 346-1129
E-mail: gambrinus@hotmail.ru

Andrei V. DRONOV
Department of Historical Geology
Geological Faculty, St.Petersburg State University
Universitetskaya Embankment 7/9
199034, St.Petersburg
RUSSIA
Tel.: (812) 328 94 80
Fax: (812)
E-mail: dronov@GG2686.spb.edu

Mary L. DROSER
Department of Earth Sciences
University of California
Riverside, CA 92521
USA
Tel.: 909-787-3797
Fax: 909-787-4324
E-mail: Mary.Droser@ucr.edu

Kerstin DROST
State Collections of Natural History Dresden
Museum of Mineralogy and
Geology Dresden (Research Centre)
Königsbrücker Landstraße 159
Dresden D-01109
GERMANY
Tel.: 0049-351-8926419
Fax: 0049-351-8926404
E-mail: drost@snsd.de

Svetlana DUBININA
Geological Institute
Russian Academy of Sciences
Pyzhevsky per. 7
109017 Moscow
RUSSIA
E-mail: dubinina@geo.tv-sign.ru

Bob ELIAS
Department of Geological Sciences
University of Manitoba
Winnipeg, Manitoba, R3T 2N2
CANADA
Tel.: (204) 474-8862
Fax: (204) 474-7623

E-mail: eliasrj@ms.umanitoba.ca

Bernd-D. ERDTMANN
Technical University Berlin, Sekr. EB 10
D-10587 Berlin
GERMANY
Tel.: +49-30-314-23582
Fax: +49-30-314-79471
E-mail: berni.erdt@tu-berlin.de
Buendel-Website: <http://www.tu-berlin.de/fb9/palaeontologie/projekt.htm>

Susana B. ESTEBAN
INSUGEO
Universidad Nacional de Tucumán
Miguel Lillo 205
4000 San Miguel de Tucumán
ARGENTINA
E-mail: insugeo@unt.edu.ar

Frank R. ETTENSOHN
Department of Geological Sciences
University of Kentucky
101 Slone Building
Lexington, KY 40506-0053
Tel.: 859-257-6232, 257-1401
Fax: 859-323-1938
E-mail: fettens@uky.edu

Kevin Ray EVANS
Geography, Geology, & Planning
Southwest Missouri State University
901 S. National Avenue
Springfield, Missouri 65804
USA
Tel.: 1-417-866-7003
E-mail: stratigraphix@earthlink.net
URL: <http://www.stratigraphix.com>

Annalisa FERRETTI
Dipartimento del Museo di Paleobiologia
e dell'Orto Botanico
Via Università 4
41100 Modena
ITALY
Tel.: ++39-059-2056527
Fax: ++39-059-218212
E-mail: ferretti@unimo.it

Stanley C. FINNEY
Dept. of Geological Sciences
California State University - Long Beach
Long Beach, CA 90840
USA
Tel: +1 (562) 985-8637
Fax: +1 (562) 985-8638

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E-mail: scfinney@csulb.edu

James FLOYD
British Geological Survey
Murchison House, West Mains Road
Edinburgh, Scotland, EH9 3LA
UK
Tel.: +44 (0)131-650-0299
Fax: +44 (0)131-668-1535
E-mail: jdf@bgs.ac.uk

Richard FORTEY
Natural History Museum
Department of Palaeontology
The Natural History Museum
Cromwell Rd
London SW7 5BD
UK
Tel: +44(0)207 942 5493
Fax: +44(0)207 942 5546
E-mail: raf@nhm.ac.uk

Robert C. FREY
Ohio Department of Health
Bureau of Environmental Health & Toxicology
246 N. High Street, P.O. Box 118
Columbus, Ohio 43216-0118
USA
Tel.: (614) 466-1069
Fax: (614) 644-7740
E-mail: rfrey@gw.odh.state.oh.us

Robert GANIS
Post Office Box 6128
Harrisburg, Pennsylvania 17112
USA
Tel.: + 717 566 9668
Fax: +717 566 7768
E-mail: bobganis@aol.com

Mansooreh GHOBADI POUR
Department of Geology
University of Esfahan
Esfahan, 81746
IRAN
Tel.: 0098 311 7932160
Fax: 0098 311 7932152
E-mail: 1) mgp.palaeo@sci.ui.ac.ir
2) m_ghobadipour@yahoo.com
Yakut GONCUOGLU
Kafkas Sitesi, 411.sok. No 65
06530 Cayyolu-Ankara
TURKEY
Tel.: 90-312-2352631
E-mail: mcgoncu@metu.edu.tr

Alexander GUBANOV
Historical Geology & Palaeontology
Department of Earth Sciences
Uppsala University
Norbyvagen 22
S-752 36 Uppsala
SWEDEN
Tel.: (+46)18 471 27 40
Fax: (+46)18 471 27 49
E-mail: Alexander.Gubanov@pal.uu.se

Juan Carlos GUTIÉRREZ-MARCO
Instituto de Geología Económica (CSIC-UCM)
Facultad de Ciencias Geológicas
28040 Madrid
SPAIN
Tel.: 34-915 44 54 59
Fax: 34-913 94 48 49
E-mail: jcgrapto@eucmax.sim.ucm.es
URL: <http://www.ucm.es/info/paleo/personal/gutierrez.htm>

Wolfgang HAMMANN
Ahornstr. 3
97535 Wasserlosen
GERMANY
Tel.-Fax: 0049/972672362
E-mail: woHammann@t-online.de

David A.T. HARPER
Geological Museum
University of Copenhagen
Øster Voldgade 5-7
DK-1350 Copenhagen K
DENMARK
Tel.: +45 35322371
Fax: +45 35322325
E-mail: dharper@savik.geomus.ku.dk
URL: <http://www.geological-museum.dk>

Mark HARRIS
Department of Geosciences
University of Wisconsin-Milwaukee
P. O. Box 413
Milwaukee, WI 53201
USA
Tel.: 414-229-2925
Fax: 414-229-6827
E-mail: mtharris@uwm.edu
Susana HEREDIA
Museo de Geología y Paleontología
Universidad Nacional del Comahue
Buenos Aires 1400
8300 Neuquén
ARGENTINA
Tel.: +54-(0)299-4490-393

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E-mail: sheredia@uncoma.edu.ar

Thomas HEUSE
Thüringer Landesanstalt für Umwelt und Geologie
PF 24
D-07727 Jena
GERMANY
Tel.: (+49-3641) 684-613
Fax: (+49-3641) 684-666
E-mail: t.heuse@tlugjena.thueringen.de

Linda HINTS
Institute of Geology at Tallinn Technical University
Estonia Boulevard 7
10143 Tallinn
ESTONIA
Tel.: +372 6454649
Fax: +372 (6) 312074
E-mail: linda.hints@gi.ee, hints@gi.ee

Olle HINTS
Institute of Geology at Tallinn Technical University
Estonia Ave 7
10143 Tallinn
ESTONIA
Tel.: +372 6454649
Fax: +372 6312074 (fax)
E-mail: olle@gi.ee
URL: <http://gaia.gi.ee/~olle>

Anette HÖGSTRÖM
Dept. of Earth Sciences
Palaeobiology
Norbyvägen 22
SE - 752 36 Uppsala
SWEDEN
Tel.: +46 (0)18 471 2736
Fax: +46 (0)18 471 2749
E-mail: anette.hogstrom@pal.uu.se

Warren D. HUFF
Department of Geology
University of Cincinnati
Cincinnati, OH 45221-0013
USA
Tel.: 513-556-3731
Fax: 513-556-6931
<http://ucaswww.mcm.uc.edu/geology/huff/huffpage/huff.html>

Mario A. HÜNICKEN
CRILAR
Mendoza y Entre Ríos
5301 Anillaco
ARGENTINA
Tel: +54-(0)3827-494285

Fax: +54-(0)3827-494231
E-mail: mhunicken@crilar.com.ar

Jisuo JIN
Department of Earth Sciences
University of Western Ontario
London, Ontario, N6A 5B7
CANADA
Tel.: (519) 661-4061
Fax: (519) 661-3198
E-mail: jjin@julian.uwo.ca

Dimitri KALJO
Institute of Geology
Tallinn Technical University
7 Estonia Blvd., 10143 Tallinn
ESTONIA
Tel.: (372) 6454653
Fax: (372) 6312074
E-mail: kaljo@gi.ee

Steve KERSHAW
Department of Geography and Earth Sciences
Brunel University
Uxbridge, Middlesex, UB8 3PH
UK
E-mail: stephen.kershaw@brunel.ac.uk

Marcus M. KEY, Jr.
Department of Geology
P.O. Box 1773
Dickinson College
Carlisle, PA 17013-2896
USA
Tel.: 1-717-245-1448
Fax: 1-717-245-1971
E-mail: key@dickinson.edu
http://www.dickinson.edu/departments/geol/faculty_staff
http://www.nhm.ac.uk/hosted_sites/iba/current4.html

Lutz KOCH
Heinrich-Heine-Strasse 5
D-58256 Ennepetal
GERMANY
Tel.: +49[0]2333 76700
Fax: +49[0]2333 974332
E-mail: l-koch@t-online.de
URL: <http://www.l-koch.de>

Tatiana KOREN´
All-Russia Scientific Research Geological Institute
(VSEGEI)
Srednii prospect 74
199106, St Petersburg
RUSSIA
E-mail: tkoren@mail.wplus.ru

Huseyin KOZLU
TPAO Exploration Group
Ankara
TURKEY
E-mail: hkozlu@petrol.tpao.gov.tr

Jaroslav KRAFT
West Bohemian Museum
Kopeckeho sady 2
CZ-301 36 Plzen
CZECH REPUBLIC
Tel.-Fax: +420 19 7237604
E-mail: jkraft@volny.cz

Petr KRAFT
Charles University in Prague
Faculty of Sciences
Institute of Geology and Palaeontology
Albertov 6
CZ-128 43 Praha 2
CZECH REPUBLIC
Tel.: +420 2 2195 2129
Fax: +420 2 2195 1452
E-mail: kraft@natur.cuni.cz

Ed LANDING
Center for Stratigraphy and Paleontology
New York State Museum
State Education department
Albany, NY 12230
USA
Tel.: 518-474-5816
Fax: 518-473-8496
E-mail: elanding@mail.nysed.gov

Philippe LEGRAND
"Tauzia" 216 cours
General de Gaulle, 33170
Gradignan
FRANCE
Tel.: (0)5 56 89 33 25
Fax: (0)5 56 89 33 24
E-mail: legrandblain@wanadoo.fr

Oliver LEHNERT
Institut für Geologie und Mineralogie
Universität Erlangen
Schlossgarten 5
D-91054 Erlangen
GERMANY
Tel.: +49-9131-8522632
Fax: +49-9131-8529295
E-mail: lehnert@geol.uni-erlangen.de
current address:
Charles University

Institute of Geology and Palaeontology
Albertov 6
128 43 Prague 2
CZECH REPUBLIC
Tel.: +42-02-21951463
Fax: +42-02-21951452
E-mail: lehnert@natur.cuni.cz
Alfred LENZ
Department of Earth Sciences
University of Western Ontario
London, ON N6A 5B7
CANADA
Tel.: (519) 661 3195
Fax: (519) 661 3198
E-mail: aclenz@uwo.ca

Stephen A. LESLIE
Department of Earth Sciences
University of Arkansas
2801 South University
Little Rock, Arkansas 72204-1099
USA
Tel.: (501) 569-8061
Fax: (501) 569-3271
E-mail: saleslie@ualr.edu

Jun LI
Nanjing Institute of Geology and Palaeontology
Academia Sinica
Nanjing 210008
CHINA
Tel.: +86-25-3282153
Fax: +86-25-3357026
E-mail: 1) drlijun@jlonline.com
2) junli@nigpas.ac.cn

Yue LI
State Key Laboratory of Paleobiology and Stratigraphy
Nanjing Institute of Geology and Palaeontology
Chinese Academy of Sciences
39 East Beijing Road, Nanjing, 210008
CHINA
(Yue Li current address: Department of Earth and
Planetary Science, University of Tokyo, Hongo 7-3-1
Bunkyo-ku, Tokyo 113-0033. Phone: 81-3-5841-4081;
email: yueli@pbs.ebs.s.u-tokyo.ac.jp)

Ulf LINNEMANN
State Museum of Mineralogy and
Geology of Dresden
Königsbrücker
Landstraße 159, Dresden, D-01109
GERMANY
Tel.: +49-351-8926403
Fax: +49-351-8926404
E-mail: linnemann@snsd.de

Anita LÖFGREN
Dept. of Geology
Lund University
Sölvegatan 13
SE-223 62 Lund
SWEDEN
Tel.: +46-46-222 78 68
Fax.: +46-46-12 14 77
E-mail: anita.lofgren@geol.lu.se

Greg A. LUDVIGSON
Iowa DNR Geological Survey
109 Trowbridge Hall
Iowa City, IA, 52242-1319
USA
Tel.: 319-335-1761
Fax: 319-335-2754
E-mail: gregory-ludvigson@uiowa.edu

Jörg MALETZ
Institut für Geologische Wissenschaften
Ernst-Moritz-Arndt Universität Greifswald
Friedrich-Ludwig-Jahn Str. 17A
D-17489 Greifswald
GERMANY
Tel.: +49 30 864569
E-mail: maletz@mail.uni-greifswald.de

María Gabriela MÁNGANO
INSUGEO
Casilla de correo 1
4000 San Miguel de Tucumán
ARGENTINA
Tel.: +54-381-4253053
Fax: +54-381-4253053
E-mail: ichtnolog@infovia.com.ar

Peep MÄNNIK
Institute of Geology
Tallinn Technical University
Estonia Ave 7
10143 Tallinn
ESTONIA
Tel.: +372 6 454 189
Fax: +372 6 312 074
E-mail: mannik@gi.ee

Alexander D. MCCRACKEN
Geological Survey of Canada
3303-33rd St. NW Calgary
Alberta T2L 2A7
CANADA
Tel.: 403-292-7130
Fax: 403-292-4961

E-mail: samccrac@NRCan.gc.ca

Sören MEISEL
Schönbrunnstr. 1
01097 Dresden
GERMANY
Tel.: +49-(0)171-3888471
E-mail: webmaster@freesi.de

Sergey V. MELNIKOV
55-71, Lenin pr., Ukhta, 169300
Komi Rep.,
RUSSIA
Tel.: 7'82147-12336
E-mail: meln@online.ru

Michal MERGL
Department of Biology
University of West Bohemia
Klatovská 51
306 19 Plzeň
CZECH REPUBLIC
Tel.: 0420-19-7442835
Fax: 0420-19-7442835
Email: mmergl@kbi.zcu.cz

Radek MIKULÁŠ
Institute of Geology, Academy of Science
Rozvojova 135, 165 00
Praha 6
CZECH REPUBLIC
Tel.: 00420-2-330 87 219
Fax: 0420-224 311 578
E-mail: mikulas@gli.cas.cz

James F. MILLER
Geography, Geology, & Planning
Southwest Missouri State University
Springfield, MO 65804-0089
USA
Tel.: 417-836-5447
Fax: 417-836-6006
E-mail: jfm845f@mail.smsu.edu

Charles E. MITCHELL
Department of Geology
Box 603050
SUNY at Buffalo
Buffalo, NY 14260-3050
USA
Tel.: (716) 645-6800 ext. 3991
Fax: (716) 645-3999
E-mail: cem@nsm.buffalo.edu

Tatiana L. MODZALEVSKAYA
All-Russian Geological Research Institute (VSEGEI)

ORDOVICIAN NEWS N° 20

Sredny pr. 74
St.Petersburg, 199106
RUSSIA
Tel.: (812)328-92-33
Fax: (812)321-30-23
E-mail: 1) vsegei@mail.wplus.net
2) modz@IB2567.spb.edu

Glasgow G12 8QQ
Scotland
UK
Tel.: +44 (0)141 330 5461
Fax: +44 (0)141 330 4817
E-mail: a.owen@earthsci.gla.ac.uk
URL: <http://www.earthsci.gla.ac.uk>

M. Cristina MOYA
Facultad de Ciencias Naturales
Universidad Nacional de Salta
4400 Salta
ARGENTINA
E-mail: crismoya@unsa.edu.ar

Joseph F. PACHUT
E-mail: jpachut@iupui.edu

Robert S. NICOLL
29 Hooper Crescent
Flynn, ACT 2615
AUSTRALIA
Tel.: +61 2 6258-4140
Email: bnicoll@goldweb.com.au

Robert PANKHURST
British Geological Survey
Keyworth, Nottingham NG12 5GG,
UK
Tel.: +44-115-9363263
Fax: +44-115-9363302
E-mail: r.pankhurst@bas.ac.uk

Jaak NOLVAK
Institute of Geology at
Tallinn Technical University
Estonia Blvd. 7
10143 Tallinn
ESTONIA
Tel.: +372 6454 677
Fax: +372 6312 074
E-mail: nolvak@gi.ee

Florentin PARIS
Sédimentologie et Paléontologie
UPR du CNRS "Géosciences"
Université de Rennes I
35042 Rennes-cedex
FRANCE
Tel.: 02 99 28 69 89
Fax: 02 99 28 61 00
E-mail: florentin.paris@univ-rennes1.fr
<http://www.geosciences.univ-rennes1.fr/www/ch/paris/Default.htm>
Chitinozoan database: <http://www.geosciences.univ-rennes1.fr/www/ch/paris/nsp/Default.htm>

Godfrey S. NOWLAN
Geological Survey of Canada
3303 -33rd Street NW
Calgary, Alberta T2L 2A7
CANADA
Tel.: 403-292-7079
Fax: 403-292-6014
E-mail: gnowlan@nrcan.gc.ca

Matthew A. PARKES
Irish Geological Heritage
Geological Survey of Ireland
Beggars Bush, Haddington Road
Dublin 4
IRELAND
Tel.: 353 (0)1-6041493 (direct), 6707444 ext 1493
E-mail: matthewparkes@gsi.ie

Gladys ORTEGA
Museo de Paleontología
Universidad Nacional de Córdoba
Casilla de Correo 1598
5000 Córdoba
ARGENTINA
Tel.: +54-(0)351-4718655
E-mail: gcortega@arnet.com.ar

Helje PÄRNASTE
Institute of Geology, Tallinn Technical University
Estonia Blvd. 7
10143 Tallinn
ESTONIA
Tel.: +372 6454678
Fax: +372 6312074
E-mail: helje@gi.ee
<http://www.gi.ee/~helje>

Alan W. OWEN
Division of Earth Sciences
University of Glasgow
Gregory Building, Lilybank Gardens

Silvio H. PERALTA
Instituto de Geología (INGEO)
Facultad Ciencias Exactas, Físicas y Naturales

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Universidad Nacional de San Juan.
Avda. José Ignacio de la Roza y calle Meglioli
5400 Rivadavia - San Juan
ARGENTINA
Tel.-Fax: 54-264 -4265103
E-mail: speralta@unsj-cuim.edu.ar

Ian PERCIVAL
Geological Survey of New South Wales
P.O. Box 76, Lidcombe 2141 NSW
AUSTRALIA
Tel.: +61 2 9649 5266
Fax: +61 2 9646 3224
E-mail: 1) iperciva@laurel.ocs.mq.edu.au
2) percivai@minerals.nsw.gov.au

José Manuel PIÇARRA
Geological and Mining Institut
Ap. 104, 7802 Beja Codex
PORTUGAL
Tel.: 351 284 311310
Fax: 351 284 325974
E-mail: jose.picarra@igm.pt

Teresa PODHALANSKA
Polish Geological Institute
Geological Museum
00-975 Warszawa
Rakowiecka 4
POLAND
Tel.: (48-22) 849 53 51
Fax: (48 22) 849 53 42
E-mail: tpod@pgi.waw.pl.

Leonid E. POPOV
Department of Geology
National Museum & Galleries of Wales
Cathays Park, Cardiff CF1 3NP
UK
Tel.: +44 (0) 20573362
Fax: +44 (0)29 20667332
E-mail: Leonid.Popov@nmgw.ac.uk

Leanne PYLE
Department of Geological Sciences
Queen's University
Kingston, Ontario K7L 3N6
CANADA
Tel.: (613) 533-6000 extension 78496
Fax: (613) 533-6592
E-mail: lpyle@geol.queensu.ca

Jan Audun RASMUSSEN
Dept. of Stratigraphy, Geological Survey of Denmark
and Greenland
Thoravej 8, DK-2400 Copenhagen NV

(new address from June 2002: Dept. of Stratigraphy
Geological Survey of Denmark and Greenland
Øster Voldgade 10, DK-1350 Copenhagen K, Denmark)
DENMARK
Tel.: +45 3814 2712
Fax: +45 3814 2050
E-mail: jar@geus.dk

Jürgen F. Von RAUMER
Dept. of Earth Sciences
Fribourg University
Pérolles, CH-1700
Fribourg
SWITZERLAND
Tel.: 0041 26 300 8927
Fax: 0041 26 300 9765
E-mail: Juergen.vonRaumer@unifr.ch

John E. REPETSKI
U.S. Geological Survey
MS 926A National Center
Reston, Virginia 20192
USA
Tel.: 703-648-5486
Fax: 703-648-6953
E-mail: jrepetski@usgs.gov (office),
jrepetski@cox.net (home)

John F. RIVA
Quebec Geoscience Centre/
Centre géoscientifique de Québec
University of Québec
880, chemin Ste-Foy, Suite 800
P.O. Box 7500
Ste-Foy, Québec G1V 4C7
CANADA
Tel.: 1 (418) 654-3177 (office)
1 (418) 653-8908 (residence)
Fax: 1 (418) 654-2615
E-mail: jriva@X1.nrcan.gc.ca

Michel ROBARDET
Géosciences - Rennes / CNRS
Université de Rennes I
Campus de Beaulieu - Bat.15
35042 - Rennes Cedex
FRANCE
Tel.: +33 2 99 28 61 05
Fax: +33 2 99 28 61 00
E-mail: Michel.Robardet@univ-rennes1.fr

David M. ROHR
Department of Geological and Physical Sciences
Sul Ross State University
400 N. Harrison St.
Alpine, TX 79832

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USA
Tel.: 915-837-8259
Fax: 915-837-8692
E-mail: drohr@sulross.edu

Jia-yu RONG
Nanjing Institute of Geology and Palaeontology
Academia Sinica
39 Beijing East Road
Nanjing 210008
CHINA
Tel.: 86-25-3282169 (office), 86-25-3353990 (home)
Fax: +86-25-3282169
E-mail: rongjy@jlonline.com

Claudia V. RUBINSTEIN
Unidad de Paleopalinoología
IANIGLA - CRICYT
C.C. 131
5500 Mendoza
ARGENTINA
Tel: +54-261-4287029/4274011
Fax: +54-261-4285940
E-mail: rubicar@supernet.com.ar

María José SALAS
Cátedra de Estratigrafía y Geología Histórica
Fac. Cs. Ex., Fís. y Nat., Univ. Nac. Córdoba
Vélez Sársfield 299
5000 Córdoba
ARGENTINA
Tel.: +54-(0)351-4332100
E-mail: mjsalas@com.uncor.edu

José A. SALFITY
Casilla de Correos 146
4400 Salta
ARGENTINA
Tel.: +54 387 425-1077
Fax: +54 387 425-1077
E-mail: salfity@sinectis.com.ar

Teresa M. SÁNCHEZ
Cátedra de Estratigrafía y Geología Histórica
Fac. Cs. Ex., Fís. y Nat., Univ. Nac. Córdoba
Vélez Sársfield 299
5000 Córdoba
ARGENTINA
Tel.: +54-(0)351-4332100
E-mail: tsanchez@com.uncor.edu

Olof SANDSTRÖM
Department of Geology, Historical Geology and
Palaeontology
Solvegatan 13, SE-223 62 Lund
SWEDEN

Tel.: +46-2227865
Fax: +46-121477
E-mail: olof.sandstrom@geol.lu.se

Ivan SANSOM
School of Earth Sciences
University of Birmingham
Birmingham B15 2TT
UK
Tel.: +44 (0)121 414 6147
Fax: +44 (0)1414 4942
E-mail: I.J.Sansom@bham.ac.uk

Graciela N. SARMIENTO
Departamento y UEI de Paleontología
Instituto de Geología Económica (CSIC-UCM)
Facultad de Ciencias Geológicas
E-28040 Madrid
SPAIN
Tel.: 34-91-3944853
Fax: 34-91-3944849
E-mail: villasar@eresmas.net,
gsarmien@geo.ucm.es

Birger SCHMITZ
Marine Geology, Earth Sciences Center
Box 460, SE-40530 Goteborg
SWEDEN
Tel.: +46-31-7734902
Fax: +46-31-7734903
E-mail: birger@gvc.gu.se.
Currently:
Wiess Visiting Professor
Department of Earth Science-MS126
Rice University
P.O. Box 1892
Houston, Texas 77251-1892
USA
Tel.: 713-348-5088
E-mail: bschmitz@rice.edu

Nikolai Valerianovich SENNIKOV
Institute Petroleum Geology, Siberian Branch of Russian
Academy of Science
Av. Koptuyg, 3, Novosibirsk, 630090
RUSSIA
Tel.: 7-3832-34-38-47
Fax: 7-3832-33-23-01
E-mail: sennikov@uiggm.nsc.ru

Enrico SERPAGLI
Dipartimento di Scienze della Terra-Paleontologia
Via Università 4
41100 Modena
ITALY
Tel.: 0039-059-2056534

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Fax: 0039-059-218212
E-mail: serpagli@unimo.it

Thomas SERVAIS
Paleontologie - Sciences de la Terre
UPRESA 8014 CNRS, Cite Scientifique SN5
F-59655 Villeneuve d'Ascq Cedex
FRANCE
Tel.: +33 (0)3 20 33 72 20
Fax: +33 (0)3 20 43 69 00
E-mail: Thomas.Servais@univ-lille1.fr
URL: <http://www.univ-lille1.fr/geosciences>

Fred SHAW
Department of Geology and Geography
Lehman College
City University of New York
Bronx, New York 10468
USA
Tel.: 718 960-8565
E-mail: fshaw@spyrat.net

John SHERGOLD
La Freunie, Benayes
19510 Masseret
FRANCE
Tel.: +33 (0) 555 981242
E-mail: shergold@medianet.fr

Lawrence SHERWIN
Geological Survey of New South Wales
PO Box 53, Orange
New South Wales 2800
AUSTRALIA
Tel.: +61 2 6392 6349
Fax: +61 2 6392 6363
E-mail: sherwin@minerals.nsw.gov.au

Jana SLAVÍČKOVÁ
Department of Palaeontology
National Museum
Václavskénám. 68
115 79, Praha 1
CZECH REPUBLIC
Tel.: +042-2-24497261
Fax: 2-24226488
E-mail: jana.slavickova@nm.cz

Paul SMITH
Lapworth Museum of Geology
School of Earth Sciences
University of Birmingham
Birmingham B15 2TT
UK
Tel.: +44(0)1214144173
Fax: +44(0)1214144942

E-mail: m.p.smith@bham.ac.uk

James SPRINKLE
Department of Geological Sciences
University of Texas
Austin, TX 78712
USA
Tel.: (512) 471-4264
Fax: (512) 471-9425
E-mail: echino@mail.utexas.edu

Azzedine SOUFIANE
INRS- Eau, Terre et Environnement
Case postale 7500
Sainte- Foy, Québec, G1V 4C7
CANADA
E-mail: Azzedine_SOUFIANE@inrs-ete.quebec.ca
Fax: 418- 654-2615

Carl W. STOCK
Department of Geological Sciences
University of Alabama
Box 870338
Tuscaloosa, AL 35487-0338
USA
Tel.: 205-348-1883
Fax: 205-348-0818
E-mail: cstock@wgs.geo.ua.edu

Svend STOUGE
Geological Survey of Denmark and Greenland
Thoravej 8
DK-2400 Copenhagen NV
(note change of address - From about May 1st.:
Øster Voldgade 10, !350 Copenhagen K, DK-1350)
DENMARK
Tel.: +45 3814 2717 (note this number will be changed
from about May 1st. New number is still not available).
Fax: +45 3814 2050
E-mail: ss@geus.dk

Wenbo SU
Group of Paleontology and Stratigraphy,
Faculty of Earth Sciences and Resources,
China University of Geosciences (Beijing),
Xueyuanlu 29
Beijing 100083
CHINA
Tel.: 086-010-82320625
E-mail: suwenbo@cugb.edu.cn

Walter C. SWEET
(January to June)
8032 N. Casas Place, Tucson, AZ 85742
USA

ORDOVICIAN NEWS N° 20

Tel.: (520) 742-3555
E-mail: sweet@azstarnet.com
(June to December)
3351 Mansion Way, Columbus, OH 43221
USA
Tel.: (614) 451-3555
E-mail: wsweet@columbus.rr.com

Hubert SZANIAWSKI
Polish Academy of Sciences
Institute of Paleobiology
Twarda 51/55
00-818 Warszawa
POLAND
Tel.: +48-22-643 41 69
Fax: +48-22-620 62 25
E-mail: szaniaw@twarda.pan.pl

John F. TAYLOR
Geoscience Department
Indiana University of Pennsylvania
Indiana, Pennsylvania, 15705
USA
Tel.: (724) 357-4469
Fax: (724) 3576208
E-mail: jftaylor@iup.edu

Tatiana TOLMACHEVA
All-Russia Scientific Research Geological Institute
(VSEGEI)
Srednii prospect 74
199106, St Petersburg
RUSSIA
E-mail: tolma@SV1403.spb.edu

Blanca A. TORO
Departamento de Geología y Paleontología
IANIGLA, CRICYT
Av. Ruíz Leal S/N°
5500, Mendoza
ARGENTINA
Tel.: 0261-4287029/4274011
Fax: 0261-4285940
E-mail: btorogr@lab.cricyt.edu.ar

M. Franco TORTELLO
Departamento Paleontología Invertebrados
Museo de Ciencias Naturales, Paseo del Bosque s/n
1900 La Plata
ARGENTINA
E-mail: tortello@museo.fcnym.unlp.edu.ar

Julie A TROTTER
The Australian National University
Research School of Earth Sciences
Earth Environment

Mills Road, Canberra, ACT, 0200
AUSTRALIA
Tel.: +61 2 6125 9967
Fax: +61 2 6125 0738
E-mail: Julie.Trotter@anu.edu.au

Susan TURNER
Hon. Res. Assoc. School of Geosciences, Monash
University. Hon. Res. Fellow, Queensland Museum
P.O. Box 3300, South Brisbane, Queensland 4101
AUSTRALIA
Tel.: 61 7 3840 7677
Fax: 61 7 3846 1918
E-mails: s.turner@mailbox.uq.edu.au,
sue.turner@qm.qld.gov.au

Marioara VAIDA
Geological Institute of Romania
1 Caransebes St., sector 1,
Bucharest 32, 78 344
ROMANIA
Tel.: +40 2 1 2 24 16 75, +40 2 1 2 24 20 93
Fax: +40 2 1 2 24 04 04
E-mail: Mari.Vaida@igr.ro,
marivaida@hotmail.com

Fons VANDENBERG
Geological Survey of Victoria
P.O. Box 500
East Melbourne, Vic 3002
AUSTRALIA
E-mail: Fons.VandenBerg@nre.vic.gov.au

Thijs VANDENBROUCKE
Research Unit Palaeontology
Ghent University
Krijgslaan 281 / S 8
9000 Ghent
BELGIUM
Tel.: + 32 9 264 46 07
Fax. : + 32 9 264 46 08
E-mail: Thijs.vandenbroucke@rug.ac.be

Jan VANMEIRHAEGHE
Krijgslaan 281/S8
B-9000 Gent
BELGIUM
Tel.: +32 (0)9 264.46.12
Fax.: +32 (0)9 264.46.08
E-mail: Jan.Vanmeirhaeghe@rug.ac.be

ORDOVICIAN NEWS N° 20

Jacques VERNIERS
Ghent University, Dept. Geology & Pedology, Lab.
Palaeontology, Krijgslaan 281 S8
B-9000 Gent
BELGIUM
Tel.: +32 (0)9 2644614
Fax: +32 (0)9 2644608
E-mail: jacques.verniers@rug.ac.be

Viive VIIRA
Institute of Geology
Tallinn Technical University
Estonia ave 7
10143 Tallinn
ESTONIA
Tel.: +372 6454189
Fax: +372 6312074
E-mail: viira@gi.ee

Enrique VILLAS
Dpto. Ciencias de la Tierra (Paleontología)
Facultad de Ciencias
Universidad de Zaragoza
C/ Pedro Cerbuna s.n.
50009 Zaragoza
SPAIN
Tel.: +34-976-76-10-78
Fax: +34-976-76-10-88
E-mail: villas@posta.unizar.es

Beatriz G. WAISFELD
Cátedra de Estratigrafía y Geología Histórica
Fac. Cs. Ex., Fís. y Nat., Univ. Nac. Córdoba
Vélez Sársfield 299
5000 Córdoba
ARGENTINA
Tel.: +54-(0)351-4332100
E-mail: bwaisfeld@gtwing.efn.uncor.edu

Xiaofeng WANG
Yichang Institute of Geology and Mineral Resources
PO Box 502, Yichang, Hubei 443003
CHINA
Tel.: +86-717-6331107, 6338286
Fax: +86-717-6331867
E-mail: wxfeng@public.yc.hb.cn (home)
ycwxiaofeng@mail.cgs.gov.cn (office)

Barry D. WEBBY
Centre for Ecostratigraphy & Paleobiology
Department of Earth and Planetary Sciences
Macquarie University
North Ryde, N.S.W., 2109
AUSTRALIA
Tel.: 02-9816-4020

Fax: 02-9850-6904
E-mail: bwebby@laurel.ocs.mq.edu.au

Charles WELLMAN
Department of Animal and Plant Sciences
University of Sheffield
Alfred Denny Building, Western Bank
Sheffield S10 2TN
UK
Tel.: 0114 222 3689
Fax: 0114 222 0002
E-mail: c.wellman@sheffield.ac.uk

Henry WILLIAMS
West-Central Team
Petro-Canada Oil and Gas
150 - 6th Avenue SW
Calgary AB, T3A 1Z2
CANADA
Tel.: (403) 296-4168
Fax: (403) 296-5770
E-mail: hwilliam@petro-canada.ca

James R. WHEELLEY
Cardiff University
Department of Earth Sciences
Main Building, PO BOX 914
Cardiff CF14 3YE
UK
Tel.: +44 (0)29 2087 6689
Fax: +44 (0)29 2087 4326
E-mail: WheelleyJR@cardiff.ac.uk
URL: <http://www.earth.cardiff.ac.uk/people/default.asp?id=168>

Reed WICANDER
Department of Geology
Central Michigan University
Mt. Pleasant, MI 48859
USA
Tel.: (989) 774-3179
Fax: (989) 774-2142
E-mail: reed.wicander@cmich.edu

Mark A. WILSON
Department of Geology
The College of Wooster
Wooster, OH 44691
USA
Tel.: 330-263-2247
Fax: 330-263-2249
E-mail: mwilson@acs.wooster.edu
URL: <http://www.wooster.edu/geology/Mwilson.html>

Ryszard WRONA
Instytut Paleobiologii

Polska Akademia Nauk
ul. Twarda 51/55
PL-00-818 Warszawa
POLAND
Tel.: (004822)697 8880
Fax: (004822)620 6225
E-mail: wrona@twarda.pan.pl
URL: <http://www.paleo.pan.pl>

Ellis YOCHELSON
12303 Stafford Lane
Bowie
Maryland 207125
USA
E-mail: yochelson.ellis@nmnh.si.edu.

Evgeny A. YOLKIN
Institute of Petroleum Geology
Siberian Branch of RAS
630090, Novosibirsk
Acad. Koptug pr., 3
RUSSIA
Tel.: +7-(3832) 33-24-31
Fax: +7-3832-33-23-01
E-mail: yolkin@uiggm.nsc.ru

Graham YOUNG
Manitoba Museum of Man and Nature
190 Rupert Avenue
Winnipeg, Manitoba R3B 0N2
CANADA
Tel.: (204) 988-0648
Fax: (204) 942-3679
E-mail: gyoung@cc.umanitoba.ca,
gyoung@manitobamuseum.ca

Renbin ZHAN
Nanjing Institute of Geology and Palaeontology
Chinese Academy of Sciences
39 East Beijing Road
Nanjing 210008

P. R. CHINA
Tel.: +86-25-3282132
Fax: +86-25-3357026
E-mail: rbzhan@nigpas.ac.cn

Yuandong ZHANG
State Key Laboratory of Palaeobiology and Stratigraphy
Nanjing Institute of Geology and Palaeontology,
Academia Sinica
East Beijing Road 39, Chi-Ming-Ssu
Nanjing 210008
CHINA
Tel.: 0086-25-3282145 (or 3282140)
Fax: 0086-25-3357026
E-mail: ydzhang@jlonline.com

Yongyi ZHEN
Division of Earth and Environmental Sciences,
The Australian Museum
AUSTRALIA
Tel.: 02-9320-6132
Fax: 02-9320-6050
E-mail: yongyi@austmus.gov.au

Zhiyi ZHOU
Nanjing Institute of Geology and Palaeontology
Academia Sinica, Chi-Ming-Ssu
Nanjing 210008
CHINA
Tel.: +86-25-3282187
Fax: +86-(0)25-3357026
E-mail: zyizhou@jlonline.com

Michael ZUYKOV
St. Petersburg State University
Dept. of Paleontology
16 Liniya, 29, 199178 St. Petersburg
RUSSIA
Tel.: +7-(812)-346-1129
Fax: +7-(812)-346-1129
E-mail: zuykov@riand.spb.su