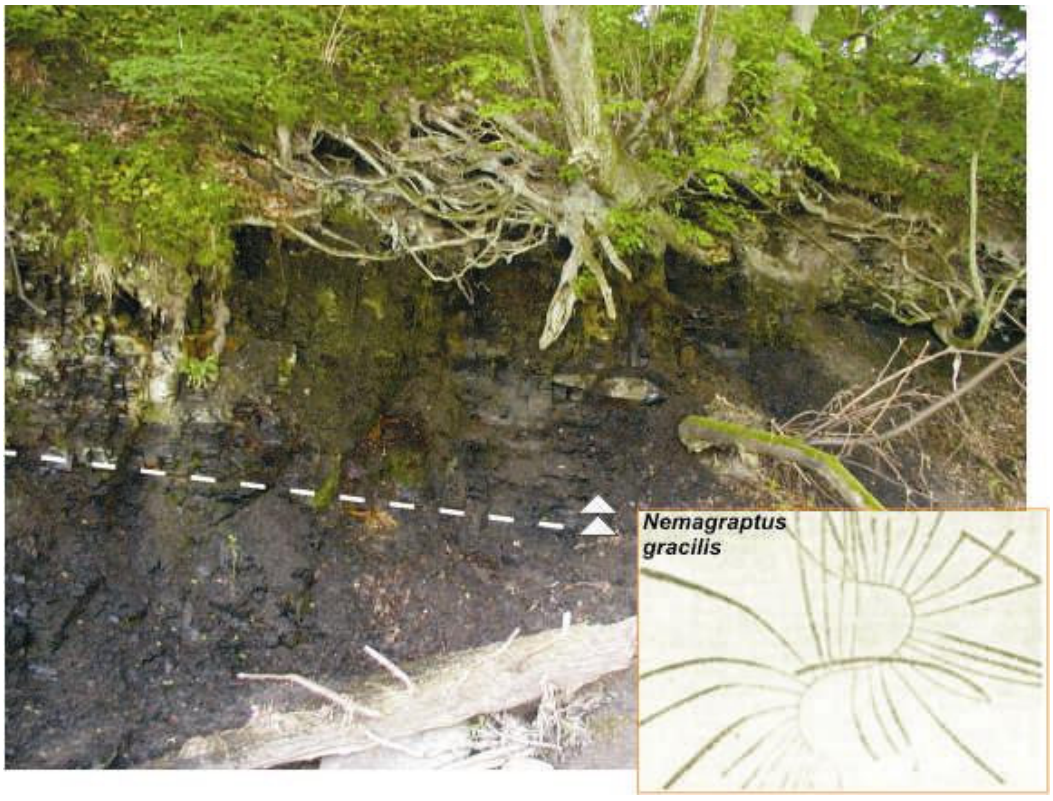
ORDOVICIAN NEWS

SUBCOMMISSION ON ORDOVICIAN STRATIGRAPHY
INTERNATIONAL COMMISSION ON STRATIGRAPHY



Nº 19

2002

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Cover: The Fågelsång section, Scania, southern Sweden: Global boundary stratotype for the base of the Upper Ordovician System, as proposed by S.M. Bergström, S.C. Finney, Chen Xu, C. Pälsson, Wang Zhi-hao & I. Grahm, 2000, Episodes, 23(3): 102-109. (Photo of the section by K. Larsson, N. gracilis specimen modified after Ruedemann, 1947).

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

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 forth one since I am serving as editor. Current number (19, 2002) 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 wel 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 includes the Second Circular for the *9th International Symposium on the Ordovician System, 7th International Graptolite Conference & Subcommission on Silurian Stratigraphy Field Meeting* to be held in Argentina, in August, 2003. 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). Current issue of *Ordovician News* is installed in a server of the CSULB, but remember that you are able to search for the three previous electronic numbers installed in the sever of the Centre for Earth and Ocean Research, University of Victoria, Canada (http://ceor.seos.uvic.ca/ordovician).

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)galbanes@com.uncor.edu

CHAIRMAN´S REPORT

During the past year, two more Ordovician GSSPs (Diabasbrottet and Fågelsång) were ratified by the IUGS, and the Green Point GSSP for the Cambrian/Ordovician boundary was dedicated on 1 June 2001. Only two GSSPs remain to be selected to complete the global time scale for the Ordovician System. Three meetings wholly or in part dedicated to Ordovician geology/paleontology were held in 2001, and future meetings of importance include the International Palaeontological Congress in July 2002, the 9th International Symposium on the Ordovician System in August 2003, and the 32rd International Geological Congress in August 2004. With its mandate from IUGS to complete selection of GSSPs for all Phanerozoic stages by 2008, the voting membership of the International Commission on Stratigraphy meets in June 2002 in Urbino, Italy with the goals of addressing the challenge from IUGS and developing a new mission and organization for ICS. Pertinent to these discussions is the future mission of the Subcommission on Ordovician Stratigraphy. With the unfortunate passing this year of Mikhail Apollonov, a long-time voting (titular) member of the Ordovician Subcommission, Andrei Dronov (St. Petersburg, Russia) was selected as a new voting member. It is likely that several voting members will retire in 2004, requiring additional new members to lead the Ordovician Subcommission into the future.

Progress on GSSPs

The Fågelsång GSSP was the subject of a ballot by the Subcommission held in September-October 2001. In this ballot, "The Global boundary Stratotype Section and Point (GSSP) for the base of the Upper Ordovician Series is defined 1.4 m below a phosphorite marker bed in the E14a outcrop along the south bank of the Sularp Brook at Fågelsång, 8 km east of the center of the City of Lund, Scania, southern Sweden. This level coincides with the first appearance of the graptolite *Nemagraptus gracilis*." This GSSP also serves as the lower boundary of the yet-to-be-named lower stage of the Upper Ordovician Series and the upper boundary of the Darriwilian Stage. The GSSP proposal is published in Bergström et al., (2000; *Episodes*, v. 23, no. 3, p. 102-109). Results of the ballot are as follows:

F.G. Aceñolaza (Argentina)	Yes
G.L. Albanesi (Argentina)	Yes
C.R. Barnes (Canada)	Yes
S.M. Bergström (USA)	Yes
D.L. Bruton (Norway)	Yes
Chen Xu (China)	Yes
R.A. Cooper (New Zealand)	Yes
O. Fatka (Czech Republic)	Yes
S.C. Finney (USA)	Yes
R.A. Fortey (UK)	Abstain
J.C. Gutiérrez-Marco (Spain)	Yes
W. Huff (USA)	Yes
C.E. Mitchell (USA)	Yes
R. Nicoll (Australia)	Yes
A. Owen (UK)	Yes
F. Paris (France)	Abstain
L. Popov (Russia)	Yes
Wang Xiaofeng (China)	Yes
S.H. Williams (Canada)	Yes
Zhou Zhiyi (China)	Yes

With 18 yes votes, 0 no votes, and 2 abstain votes, the GSSP was approved by the Subcommission with a 100% majority. Subsequently, the Diabasbrottet GSSP, approved last year by the Subcommission, and the Fågelsång GSSP were approved by the International Commission on Stratigraphy by 87% majority votes and then ratified by the IUGS Executive. Kent Larrson and colleagues at Lund University are planning dedication ceremonies for the Diabasbrottet and Fågelsång GSSPs for the spring 2003. I encourage Ordovician specialists, especially those in the Baltic region, to attend.

Dedication of the Green Point GSSP for the base of the Ordovician System was held on 1 June 2001 with an outstanding ceremony organized by Henry Williams, Godfrey Nowlan and colleagues in Newfoundland. Those in attendance included a good sampling of Ordovician stratigraphers/ paleontologists, representatives of the Newfoundland government, officials and many employees of Parks Canada, local geologists, and a number of local residents. Following comments by government officials, Godfrey Nowlan, and myself, an impressive plaque was unveiled. This was followed by the "graptolite rap" performed by Fred Sheppard (Parks Canada) and substantial food and drink at the interpretive center of the Gros Morne National Park. Photographs and a report on the dedication ceremony were published on the front page of the Corner Brook newspaper the following morning.

Of particular note, the Subcommission on Silurian Stratigraphy has voted to re-evaluate and reconsider the Dobs Linn GSSP for the base of the Silurian System, which sets the upper limit of the Ordovician System. For detailed information, I direct you to *Silurian Times* No. 9 at http://www.stfx.ca/people /mmelchin/SILURIAN9.HTM.

As reported last year, selection of the GSSP for the base of the Middle Ordovician Series is critical for completion of the global time scale for the Ordovician System. Following a field excursion in November 2000

and subsequent study of graptolites collected at that time, serious concerns were raised with regard to the FAD of the conodont *Tripodus laevis* in the Whiterock Narrows section, Nevada - the primary candidate biohorizon and stratotype section under consideration by the Subcommission. The issues were discussed further at a Subcommission meeting in November 2001 at the Annual Meeting of the Geological Society of America in Boston, and much of the essence of these discussions are in articles and documents posted on the web site (http://seis.natsci.csulb.edu/ordstrat1/ default.htm) for the Ordovician Stratigraphy Discussion Forum. Accordingly, the Subcommission encouraged further work on sections in the Great Basin that might serve as a Global Stratotype section and a call was sent to all corresponding members of the Subcommission to consider and to submit proposals for alternative biohorizons and stratotype sections for the boundary. At this time, Guillermo Albanesi has proposed a GSSP in Argentina, Ray Ethington is investigating the conodont succession at sections in the Ibex area, Utah, and Chuck Mitchell and Svend Stouge will be evaluating western Newfoundland sections during the summer. Those wishing to join in the discussions are encouraged to post articles directly on the Ordovician Stratigraphy web site. Extensive documents, including proposals for biohorizons and/or candidate stratotype sections, should be sent to me, and I will arranged for them to be loaded on the web site.

Stig Bergström is leader of a group that is evaluating biohorizons and sections for the GSSP for the base of the upper stage of the Upper Ordovician Series. All who wish to participate in this working group should contact Stig.

Both boundaries will be a primary focus of Subcommission business meetings and discussion sessions at the 9th International Symposium on the Ordovician System. Those working on potential GSSPs will be expected to present proposals. It is my goal to move towards completion of the Ordovician time scale by 2004.

The Future of ICS and the Ordovician Subcommission

Through my service as 2nd Vice-Chair of the International Commission on Stratigraphy, I've developed an appreciation of the many activities and accomplishments of the ICS and its many Subcommissions, as well as its present challenges. The IUGS has mandated that the ICS complete selection of GSSPs for all Phanerozoic stages by 2008. And, what is the future of ICS after 2008? The present executive committee, led by its dynamic chair Felix Gradstein, is especially active and taking steps to address these challenges. Accordingly, the "First Conference on Future Directions in Stratigraphy" will take place in Urbino, Italy, 14-16 June 2002. I have the pleasure of serving as organizing chair. Besides the full executive committee, almost all ICS Subcommissions will be represented. This will be the first such meeting of full voting membership of ICS in many years. Its importance is recognized by the IUGS through the attendance of Werner Janoshek, Secretary General (and former Treasurer) of IUGS, and Attilio Boriani, President of the 32nd International Geological Congress (and former Secretary General of IUGS). Issues to be addressed include: 1) strategies to ensure progress within Subcommissions, 2) a new mission for ICS, 3) a new organizational structure, 4) association status and new sources of funding, 5) dissemination of knowledge, results, and products, 6) a stratigraphic prize, and 7) plans for the 32nd IGC. Draft resolutions will be formulated and will be the focus of discussions at the 32nd IGC that will be open to the entire ICS membership. Chair Gradstein has proposed that high-resolution global change as recorded in dynamic stratigraphy, i.e. geological process oriented stratigraphy, would be an exciting and socially responsible challenge. No doubt, other missions will be proposed and discussed. I encourage you to visit the web site for the International Commission on Stratigraphy (http://www.micropress.org/stratigraphy/). Among its varied contents are the Global Time Scale with approved GSSPs, the abridged version of the International Stratigraphic Guide, and descriptions and photographs of the many of the ratified GSSPs.

Consistent with a new mission for ICS is a new mission for the Ordovician Subcommission. It is my opinion that the GOES (Global Ordovician Earth System) program could be that mission. Its goal is to encourage integrated multi-disciplinary investigations of global events during the Ordovician Period. Ricardo Astini, Chris Barnes, and Bill Berry were asked to serve as a steering committee for this informal program with the Late Ordovician mass extinction and associated global changes being an initial issue to be addressed. But, many more issues can be formulated. The Subcommission will sponsor a symposium session with the title Global Ordovician Earth System at the 32nd IGC. It will include papers on the Late Ordovician event, but other topics are encouraged. Should you wish to participate, please contact the session conveners: myself, Chris Barnes, and Bill Berry. The GOES program also will be a topic for serious consideration at the 9th ISOS not only through presentations in the technical program, but also in discussions of the future status and mission of the Ordovician Subcommission.

Other Activities/Future Meetings

Although I was not able to participate, there were several successful meetings last year: the WOGOGOB meeting in May 2001, organized by Svend Stouge and colleagues in Copenhagen, which included a field excursion to Fågelsång; the meeting "Early Palaeozoic Palaeogeography and Palaeobiogeography of Western Europe and North Africa" organized by Tom Servais and colleagues in Lille, France, a product of which will be a book of the same title with contributions on the Ordovician; a meeting for IGCP 410 at Riverside, California hosted by Mary Droser and resulting in an important publication on Ordovician Biodiversity, and an field excursion to Mongolia organized by IGCP 410 (participants tell me that, although physically and mentally demanding, it was an awesome experience).

Many of you may receive this newsletter after returning from the International Palaeontological Congress in Sydney. The Ordovician System will compose a substantial part of the technical program with a final meeting of IGCP 410 and Ordovician graptolites will be the major focus of a field excursion to Victoria.

Organization for the 9th ISOS in San Juan, Argentina in August 2003 is far advanced; the 2nd circular is included in this newsletter. From some, I have heard concerns that the economic crisis in Argentina will impact the meeting. Our Argentine colleagues are suffering, but I assure you that the meeting is very well organized and will be a logistical success. I encourage all of you to attend. The meeting will be run jointing with a Field Meeting of the Subcommission on Silurian Stratigraphy and with an International Conference on Graptolites, ensuring a large number of interested participants. The field excursions provide the opportunity to examine richly fossiliferous successions of both Gondwanan and Laurentian character. And, there are serious issues to be addressed, in particular, the remaining GSSPs, and the future mission, direction, and organization of the Subcommission.

The 32nd International Geological Congress scheduled for August 2004 in Florence provides not only a remarkable setting but also an opportunity for business important to the future of the Subcommission. It will be a time at which a new chair and new voting (titular) members of the Subcommission begin their terms. The GOES program will be on the technical program. An important open meeting will be held on the future of the International Commission on Stratigraphy; similar discussions will take place with regard to the Ordovician Subcommission.

STAN FINNEY

SOS ANNUAL REPORT FOR 2001

1. Name of subcommission

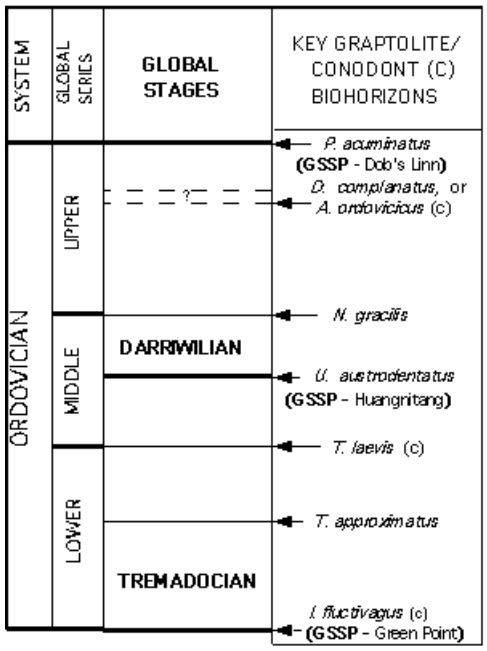
Subcommission on Ordovician Stratigraphy (SOS).

2. Overall objectives

The Subcommission promotes international cooperation in Ordovician Stratigraphy. 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.

3. Summary table of Ordovician subdivisions



4. Fit within IUGS science policy

The ultimate goal of the Subcommission 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 Subcommission involves much of the global geological community.

5. Organization

a. Subcommission 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. Informal intra-Ordovician Working Groups
Conveners of these groups are as follows:
(i) base of *laevis* (base of Middle Ordovician Series) - R. Ethington, S. Finney, (ii) base of *ordovicicus* (base of upper Stage of Upper Ordovician Series) - S. Bergström and C.R. Barnes
c. GOES Program - research committee
Secretary, W.B.N. Berry (U.S.A.) 4 other members (R. Astini, C. Barnes, S. Bergström, and S. Finney).

6. 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 Subcommission 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. In late 2000, SOS received grants from the American Chemical Society-Petroleum Research Funds and International Division of the Geological Society of America to support the travel of several non-North American colleagues to the Annual Meeting of the Geological Society of America (Reno, Nevada; November 2000), where the Subcommission organized a symposium session and a field excursion on selection of a GSSP for the base of the Middle Ordovician Series.

7. Interface with other international projects

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

8. Chief accomplishments in 2001

a. The base of the *Tetragraptus approximatus* graptolite Zone in the Diabasbrottet section in southern Sweden was approved by the Subcommission as the GSSP for the base of the Second Stage, yet to be named, for the Ordovician System (upper stage of Lower Ordovician Series). The vote was Yes - 20, No - 1. The proposal is now before the ICS for a vote of approval.

b. In early November 2001, the base of the *Nemagraptus gracilis* graptolite Zone in the Fågelsång section in Sweden was approved by the Subcommission as the GSSP for the base of the Upper Ordovician Series. The vote was Yes - 18, No - 0, abstain - 2. The proposal is now before the ICS for a vote of approval.

c. An Ordovician Stratigraphy Discussion Group website: http://seis.natsci.csulb.edu/ordstrat2/default.htm was set up to facilitate discussion on the GSSP for the base of the Middle Ordovician Series. Posted reports described serious deficiencies with the proposed biohorizon and stratotype section (the base of the *Tripodus laevis* conodont Zone at Whiterock Narrows, Nevada) and proposed other biohorizons and stratotype sections for the GSSP. The web site proved invaluable in facilitating discussion and making important progress.

d. At a Subcommission business meeting in Boston, Massachusetts in November, 2001 (at the Annual Meeting of the Geological Society of America), the GSSP for the base of the Middle Ordovician Series was a major topic of discussion. The consensus of those in attendance was to consider a new biohorizon (the FAD of the conodont *Protoprioniodus aranda*) and new candidate stratotype sections. A report of this meeting is now being distributed to all voting members, requesting their comments and opinions. If a majority wish to consider the new biohorizon, the Subcommission will move quickly to consider potential stratotype sections and to evaluation the correlation potential of the biohorizon. A general interest Friends of the Ordovician meeting was attended by 45 participants of the GSA meeting, and 15 papers were presented in a topical session titled “New insights into Late Ordovician Climate, Oceanography, and Tectonics.”

e. The GOES (Global Ordovician Earth Systems) Program stimulated research on the Late Ordovician mass extinction as recorded in stratigraphic successions in the Carnic Alps, the results of which will be incorporated with those from similar integrated multi-disciplinary studies of Late Ordovician successions in Nevada.

f. The Subcommission sponsored a successful meeting and field excursion in Morocco, 30 January to 7 February, 2001 with the title "The Gondwanan Platform during Ordovician times: Climatic, eustatic and geodynamic evolution." The field excursion examined Ordovician strata in the coastal Meseta, central High Atlas, and central-eastern Anti-Atlas.

g. The WOGOGOB (Working Group on Ordovician Geology of the Baltic) held its biennial meeting 16-17 May 2001 in Copenhagen, Denmark with a field excursion to Scania, Sweden, 18-20 May 2001.

h. On May 31, 2001, a formal ceremony took place at Green Point, western Newfoundland for dedication of the GSSP for the base of the Ordovician System.

9. Chief problems encountered in 2001

The lack of travel support limited the participation of Voting Members from outside North America in Subcommission activities at the Annual Meeting of the Geological Society of America.

The only candidate stratotype section and the biohorizon chosen for defining the base of the Middle Ordovician Series were found to be deficient. As a result, the Subcommission must evaluate a new biohorizon and candidate stratotype sections.

10. Chief products in 2001

a. An 94-page issue of *Ordovician News*, No. 18, edited by G.L. Albanesi, was published and posted on the Subcommission's web page (http://ceor.seos.uvic.ca/Ordovician/).

11. Work plan for next year

a. *Ordovician News*, No. 19, assembled by G.L. Albanesi, will be published in the Spring 2002.

b. It is anticipated that the GSSPs for the base of the second stage of the Ordovician System (upper stage of Lower Ordovician Series; yet to be named) and for the base of the Upper Ordovician Series (and its lowest stage; yet to be named) will be approved by the International Commission on Stratigraphy in late 2001 and ratified by IUGS in 2002.

c. Voting members are presently being consulted regarding the course to take on selection of a GSSP for the base of the Middle Ordovician Series. Options are to consider new candidate stratotype sections for the FAD of the conodont *Tripodus laevis* or, instead, to choose a new biohorizon (the FAD of the conodont *Protoprioniodus aranda)* for definition of the boundary. A decision on the biohorizon will be made by the end of 2001, and a strict deadline of 3 months will be set for submission of potential candidate stratotype sections. The best potential candidate stratotype section is at Niquivil in the Precordillera of Argentina. A field business meeting is planned for November 2002 to visit this section; it will be in conjunction with the biennial meeting of the Argentine Congress on Paleontology and Biostratigraphy. Investigations of other candidate sections may be needed, but the Subcommission's goal is to be evaluating and possibly voting on stratotype sections before the end of 2002.

d. The Working Group on the GSSP for the base of the upper stage of the Upper Ordovician Series has been dormant, while the Subcommission concentrated its efforts on other stage and series boundaries. However, now that GSSP will receive considerable attention. The Working Group is being reconstituted. Candidate stratotype sections will be evaluated in 2002. Whether voting takes place in 2002 depends on the progress of the Working Group.

e. The steering committee of the GOES (Global Ordovician Earth Systems) Program will be encouraging work towards, and recruiting papers for, a symposium session that the Subcommission will sponsor at the 32nd IGC. The session title is titled "Global Ordovician Earth System."

12. Critical milestones to be achieved next year

a. Approval by ICS and ratification by IUGS of Diabasbrottet and Fågelsång GSSPs.

b. Evaluation of new biohorizon for base of Middle Ordovician Series and of candidate stratotype sections, especially the section at Niquivil in the Argentina Precordillera.

c. Evaluation of candidate stratotype sections for base of upper stage of Upper Ordovician Series.

13. Anticipated results/products next year

a. Publication of *Ordovician News* No. 19.

b. Determination of biohorizon for base of Middle Ordovician Series and identification and evaluation of candidate stratotype sections.

c. If progress is rapid on identification and evaluation of candidate stratotype sections, approval of GSSP for upper stage of Upper Ordovician Series.

14. Communication plans

a. *Ordovician News* will be published each spring and posted on the Subcommission's web site. A limited

number of hard copies will be printed for archives and for distribution to members requesting hard copies.

b. The web site for the Ordovician Stratigraphy Discussion Group will continue active use. Its primary focus is the GSSP for the base of the Middle Ordovician Series. However, it will evolve to include discussions of other topics.

c. The 9th International Symposium on the Ordovician System will be held in San Juan, Argentina in August 2003. A web site is being constructed for dissemination of information, circulars, and registration for the meeting.

d. The Subcommission Chair will spend March to July 2002 in Austria. During that time, he will schedule a formal Subcommission Business meeting for members in Europe. The purpose of the meeting will be to further discussions on the two boundaries still to be defined.

e. A Subcommission business meeting will be scheduled at the Annual Meeting of the Geological Society of America to be held in Denver, Colorado in October 2002. The purpose will be to discuss candidate stratotype sections for the base of the upper stage of the Upper Ordovician Series. Most members of the boundary working group are located inNorth America as are some of the best potential stratotype sections. Funding will be sought to support the travel of working group members located outside North America.

15. Potential funding sources outside IUGS

California State University at Long Beach will support most of the Chair's travel expenses to the Geological Society of America meeting. The Chair will apply for a research grant for a project in Argentina. If funded, he will travel to Argentina with grant support for field research at the time of the meeting on the Niquivil section. Thus, he will not need to use Subcommission funds for that purpose and the request in next year's budget can be used instead to further support the travel of other members of the boundary working group.Those proposing candidate stratotype sections for the base of the Middle Ordovician Series or the base of the upper stage of the Upper Ordovician Series will need to apply to foundations, their institutions, and other sources for support of any additional investigations of the sections that might be needed.

16. Chief accomplishments/results over the last 5 years (1997-2001)

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 by the Subcommission 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 Subcommission.

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. Publication of *Ordovician News* nos. 14-18 and the posting of nos. 16-18 on the Subcommission's web site.

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

i. 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.

j. 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."

k. 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.

17. Anticipated objectives and work plans for the next 5 years (2002-2006)

a. Approval and ratification of GSSPs remaining to complete subdivision of Ordovician System with goal of completion by 2003.

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 Subcommission's focus to inter-disciplinary investigation of the global Ordovician Earth system.

INTERNATIONAL SYMPOSIA, CONFERENCES AND FIELD MEETINGS

WOGOGOB 2001

"Wobblygob" to some of us, or more correctly – the Working Group on the Ordovician Geology of Baltoscandia, was originally, a forum primarily for Ordovician workers from Norway, Sweden and Denmark, but has since been enlarged to accommodate colleagues from the Baltic States (Estonia, Latvia, Lithuania), Poland and Russia. In May 2001, the meeting was hosted by the Geological Museum, University of Copenhagen, and well organised by David Harper and Svend Stouge from the Geological Survey of Denmark and Greenland (GEUS) together with their colleagues. If my memory serves me correctly, this was the sixth official meeting although I remember the initial meeting in 1988 (making the number seven) which somehow does not count. I understand that the organizers had more than their share of anguish when arranging this meeting with a series of no-shows. None the less, things sorted themselves out and I believe David Harper is now preparing to organise the Palaeontological Association meeting at Christmas 2001, so do come. There is nothing like "Wonderful Copenhagen" and the Danes have a great knack of producing delicious food and wonderful beer (with aid from the Carlsberg Foundation) at all times of the day. The auditorium at the Geological Museum has been recently decorated, the pine floors varnished and there is an air of the grand old days in the walls and around the bar top covering the rotunda. The museum staff and research students did all they could to make us feel at home and the dinner upstairs with live music from the Irish-Western group of Svend Stouge, Jan Audun Rasmussen and Claus Sten made for a lively evening.

There were two days of lectures (May 17-18) followed by an excursion to Scania, led by Kent Larsen from Lund University. Unfortunately I could not take part in this but I understand it was a huge success and participants had the experience of crossing the new Øresund road-rail bridge which now joins Denmark and Sweden. The formal lectures, 27 in all, covered the themes of Biodiversity, Palaeontology and Stratigraphy, Geochemistry, Palaeoenvironments and Faunal Dynamics and Geodynamics and Sequence Stratigraphy and there was an impressive poster session. Lectures were generally of high standard but often represented a reinterpretation of older palaeontological and stratigraphical data presented in a new quantitative way. This is a welcome trend but I hope we shall not see this become a substitute for the still much needed field work and collecting followed by careful preparation of material, identification and description.

This time the meeting also included contributors to IGCP project 410 (The Great Ordovician Biodiversification Event) and from this we were treated to an instructive lecture on Ordovician biodiversity changes across Baltoscandia by Øyvind Hammer. He has put together an impressive database so-far standing at 8500 records of first and last appearances of a single species at a given locality and freely available on the Internet (asaphus.uio.no). David Harper's knowledge of Ordovician brachiopods is becoming most impressive and he and Linda Hints from Tallinn share years of experience. It was unfortunate that Leonid Popov and co-workers did not turn up as their abstract promised some new ideas on the evolution of the Baltica palaeocontinent. Discussions on trilobites were well taken care of by Jan Bergström, Arne Nielsen and Kristina Månsson; graptolites by Sven Olaf Egenhoff and Jörg Maletz; conodonts by Anita Löfgren and Jan Rasmussen (who has recently published an ex cellent account "Conodont biostratigraphy and taxonomy of the Ordovician shelf margin deposits in the Scandinavian Caledonides," in the long awaited Fossils & Strata No. 48 which appeared at the meeting), to mention the most important. Andrei Dronov and his team provided excellent documentation of "fine tuned" stratigraphy, whilst the highlight for me was Bjørn Buchardt's presentation on carbon and oxygen isotope signals from limestones. His photographs of polished surfaces were made directly from placing the hand specimens on a computer scanner to reveal colour contrasts, crystallisation history and diagenesis. Baltoscandian Ordovician limestones are probably the best preserved in the world and the least altered, yet they provide elevated seawater temperatures of from 35-45 degrees C. This cannot be correct so where is the trap? I am sure Bjørn would be happy to receive suggestions.

The crowd of approximately 45 people contained many new and young faces of both male and female. This is encouraging and I left the meeting convinced that research in the Ordovician of Baltoscandia has an exciting future.

DAVID L. BRUTON

BASE OF THE ORDOVICIAN CAST IN STONE IN WESTERN NEWFOUNDLAND

A formal ceremony to unveil a plaque marking the site of the global stratotype and point (GSSP) for the base of the Ordovician System was held at Green Point, Newfoundland on 1 June 2001. The International Commission on Stratigraphy in conjunction with Parks Canada organized the celebration to mesh with the Geological Association of Canada Annual Meeting held in St. John's, Newfoundland 28-30 May 2001. A field trip associated with that meeting brought a group interested in the stratigraphy, structure and oil potential of western Newfoundland to the region. The field trippers joined a group of former residents of Green Point, a community that was moved when Gros Morne National Park was established, and many other local people, including officials of Parks Canada.

Stan Finney (California State University - Long Beach) addresses the participants at the unveiling of the plaque for the base of the Ordovician at Green Point.

Having visited the classic megabreccias of the Cow Head Group at Cow Head in the morning, the field trip headed to Green Point for the ceremony that was scheduled for 3:00 p.m. Godfrey Nowlan (Secretary of the International Working Group on the Cambrian - Ordovician Boundary) visited the Cow Head School in the early afternoon to make a presentation to students on the significance of the local rocks and the value of fossils in calibrating geological time. He was assisted by Rob Hingston of Parks Canada who brought some excellent specimens of local fossils for the students to look at.

Rowena Gilley, daughter of Green Point's oldest settler, her husband Gerald Gilley and her son Chip Gilley share the unveiling with Stan Finney.

The Government of Canada was represented at the Green Point ceremony by Mr. Gerry Byrne, the Member of Parliament for Humber-St. Barbe-Baie Verte. Mr. Byrne brought greetings from the Minister of Canadian Heritage, the Honourable Sheila Copps and welcomed the assembled scientists and local residents. He noted the importance of Gros Morne National Park, in which the GSSP is located, to western Newfoundland and said: "Gros Morne has helped us to better understand and appreciate some of the many gifts of natural heritage that surround us.....and perhaps no element of that heritage takes a more prominent place than the rocks that surround us". The Government of Newfoundland and Labrador was represented by provincial paleontologist Doug Boyce who pointed out that the province now has the unique situation of having both the base and top of the Cambrian System defined in Newfoundland.

The International Working Group on the Cambrian - Ordovician Boundary, part of the Ordovician Subcommission of the International Commission on Stratigraphy, was represented by Godfrey Nowlan (Geological Survey of Canada) who paid tribute to the scientists who had first made the case for the Green Point section, notably Dr. Chris Barnes (University of Victoria) who was in the crowd. Dr. Nowlan went on to read comments from Roger Cooper (Institute of Geological and Nuclear Sciences in New Zealand) who chaired the Working Group but was unable to attend the ceremony. Dr. Cooper's comments included reference to modern geological science being an international collaborative venture. He noted that the ceremony marked the conclusion of 24 years of effort by scientists from around the world and indicated that he saluted their efforts. He noted that "it required a willingness to cooperate, collaborate and undertake personal research to resolve the problem of dating and correlating strata around the world at the beginning of Ordovician time". He also acknowledged the difficult compromise that the group had to reach in order to achieve a clear majority decision. Dr. Cooper thanked the staff of Gros Morne National Park for their cooperation and assistance with demarcation and protection of Green Point.

The final speaker at the ceremony was Dr. Stan Finney (California State University, Long Beach) who is Chairman of the Subcommission on Ordovician Stratigraphy. He highlighted the significance of world stratotypes and the process by which Green Point was selected. He acknowledged the tremendous intellectual efforts of the scientists involved in the work. Finally, he noted that "Geology is a very human science and selection of this stratotype at Green Point represents the culmination of a human process, and so it is a great pleasure to dedicate this plaque today".

The plaque describing the base of the Ordovician at Green Point, Newfoundland, Canada.

The plaque, bolted to a large Precambrian boulder derived from the Long Range Mountains during glaciation, was then unveiled by Mr. Byrne, Dr. Finney and former Green Point resident Mrs. Rowena Gilles, her husband Mr. Gerald Gilles and their son Chip. Mrs. Gilles is the daughter of Mrs. Martha Payne, the oldest surviving former resident of Green Point.

Fred Sheppard dressed as the graptolite Rhabdinopora prepares to do the "graptolite rap" at the Green Point ceremony.

From: Reservoir, v. 28, no. 8, September 2001 (Canadian Society of Petroleum Geologists)

WOGOGOB-2001 was held in Copenhagen May 16th and May 20th. The meeting was arranged by D.A.T. Harper (Geological Museum, Copenhagen), Svend Stouge (Geological Survey of Denmark and Greenland, Copenhagen) and Kent Larsson (Univeristy of Lund, Sweden). The meeting hosted nearly 60 delegates and began with two days of technical sessions in Copenhagen followed by a two-days fieldtrip in Scania, Sweden. The meeting was sponsored by the Geological Museum, Copenhagen, the Geological Survey of Denmark and Greenland, the Carlsberg Foundation, the Danish Natural Science Foundation and IGCP Project 410 " The Great Ordovician Diversification Event". ***Reference:*** Harper, D.A.T. & S. Stouge 2001 (eds). WOGOGOB-2001. Working Group on the Ordovician of Baltosccandia. Øresund Region, mid May [May 16th (evening) to May 29th] 2001. Abstracts: 47 pp.

SVEND STOUGE

INTERNATIONAL SUBCOMMISSION ON CAMBRIAN STRATIGRAPHY
Meeting 2002 in Carcassonne, France

SECOND CIRCULAR AND CALL FOR PAPERS

Dates of the meeting:
Pre-meeting excursion (2 days) to the southern Montagne Noire: September, 12-13th, 2002
Conference and workshop (1 day): September, 14th, 2002

Venue:
Caunes-Minervois, at 18 km to the northeast of Carcassonne

Access to Carcassonne:
By plane: there are direct flights from Charleroi, Frankfurt, London and Paris.
By train: the city is located at 90 km from Toulouse and 130 km from Montpellier (southern France).

Organizers:
José Javier ALVARO, Villeneuve d'Ascq
Sebastien CLAUSEN, Villeneuve d'Ascq
Françoise DEBRENNE, Paris
John H. SHERGOLD, Masseret
Daniel VIZCAINO, Carcassonne

Organizing institutions:
International Subcommission on Cambrian Stratigraphy (ISCS), Association Paléontologique Française (APF), Centre National de la Recherche Scientifique (CNRS): UPRESA 8014, Comité Français de Stratigraphie (CFS), Geobios, Société Géologique de France (SGF)

Meeting language:
Abstracts, posters and oral communications must be presented in English.

Abstracts:
Talks and posters on geological and paleontological topics related to the Cambrian and its boundaries are invited. Text of abstracts, not exceeding 300 words, should be sent to J. Javier Álvaro at the address below before 1st May, 2002. State whether the abstract is for an oral or poster presentation. Abstracts should preferably be submitted as an e-mail message or attachment.

Conference proceedings:
Scientific contributions (talks and posters) can be submitted as manuscripts to Geobios. They must be written in English and correspond to the 'Guidelines for Authors' of this journal (available in http://geobios.univ-lyon1.fr/). Each participant will be able to submit one contribution as first author. Papers must be presented in their final version at the registration desk of the conference. Deadline: September, 14th, 2002. Accepted papers will be published together as a thematic volume of Geobios.

Provisional programme of the conference:
Wednesday, September 11: Arrival of participants of the pre-meeting excursion in Carcassonne, and reception in Caunes-Minervois. Participants will be met in Carcassonne airport and train station, or directly in Caunes-Minervois.
Thursday, September 12: Excursion to the Cambrian outcrops of the Minervois nappe.
Friday, September 13: Excursion to the Cambrian outcrops of the Pardailhan nappe.
Saturday, September 14: Oral communications (one overhead projector and two slide projectors will be available), poster presentations and ISCS workshop.
Sunday, September 15: Participants will be led to Carcassonne airport and train station.

Registration form and costs:
NAME:
ADDRESS:
Phone:
Fax:
E-mail:
Excursion and meeting fee: (before May 1st) 425 euros (after May 1st) 475 euros.

Payments must arrive before May 1st by bank transfer on the following bank account. Cheques (excepting from French banks) are not accepted. Credit card payment is not possible.
Bank: La Poste (France)
Bank account holder: ALVARO JOSE JAVIER
Account number: FR 96 20041 01005 1377986F026 94
We will confirm the arrival of your payment by e-mail, as soon as it arrived.

Important dates:
1st May 2002: Deadline for Abstracts and registration
1st July 2002: Third circular – Programme and final arrangements

Please, send all the correspondence (preferably via e-mail) to:
José Javier ALVARO
USTL-Sciences de la Terre
UPRESA 8014 CNRS
Cité Scientifique SN5
F-59655 Villeneuve d'Ascq cedex
FRANCE
Tel : (+33) 03 20336392
Fax : (+33) 03 20436900
E-mail: Jose-Javier.Alvaro@univ-lille1.fr

FIRST INTERNATIONAL PALAEONTOLOGICAL CONGRESS
AUSTRALIA
July 6-10, 2002, Sydney

Under the auspices of the International Palaeontological
Association, the Australasian Association of
Palaeontologists, and the Macquarie University Centre
for Ecostratigraphy and Palaeobiology
Preliminary notification and Expression of Interest

Venue:
Sydney, principally Macquarie University and the Australian Museum. There is abundant accommodation (student to 4-star categories) in the vicinity of Macquarie University.

Symposia (in parallel sessions) will include some or all of:
Global extinction events: abrupt, gradual or polyphase
Terrestrialization
Evolution of pelagic communities through time
"Black smoker" and "cold seep" faunas past and present
Computer palaeobiogeography
Organic-rich facies, faunas and genesis
Experimental taphonomy and unusual preservation
Biomineralization—including periodicity
Early Palaeozoic vertebrate zoogeography
Palaeozoic communities revisited
High precision biostratigraphic alignments
Spongiomorphs
Implications of advances in fossil plant anatomy
Palynomorphs as environmental indicators
Towards zonation of the Proterozoic
Dinosaur evolution and biogeography
Early mammalian evolution
Cainozoic mammalian biogeography
Molluscan functional morphology and biogeography
Trace fossils
Living fossils

Posters on any of the conference themes

Coupled with these will be:
Meetings of IGCP 410 and IGCP 421

Proposed excursions (dependent on interest):
Proterozoic–Cambrian of the Flinders Range, South Australia
Ordovician–Silurian graptolite succession of SE Australia
Palaeozoics of NE Queensland (Broken River region; Burdekin and Hodgkinson Basins) and the Canning Basin of Western Australia
Palaeozoic fish
Permian of the Sydney Basin
Cainozoic vertebrates of Queensland
Mesozoic sequences of New Zealand
The classic Cainozoic sequences of New Zealand
Cainozoic sequences of SE Australia
Reef dynamics (Heron or Lady Elliot Island)

Note that the program may appear "light" as regards, for instance, foraminifers and conodonts. Forams 2002 will have taken place in Perth in early February. The International Conodont Symposium. ECOS-8 (Oviedo-Toulouse-Montpellier), is timed so that participants may conveniently link up with IPC 2002, including its pre-conference excursions and/or the Australian Geological Convention in Adelaide (30 June–5 July). However, such meetings should in no way inhibit presentation of contributions on any fossil group to any appropriate symposium.

Contacts:
E-mail address for everything to do with IPC 2002:

Specific questions might also be addressed to: IPC2002@mq.edu.au, Or:
Glenn Brock—tel. (02) 9850 8334; e-mail: gbrock@laurel.ocs.mq.edu.au
Ruth Mawson—tel.: (02) 9850 8336; e-mail: rmawson@laurel.ocs.mq.edu.au
John Talent—tel.: (02) 9850 8336; e-mail: jtalent@laurel.ocs.mq.edu.au

In order to make this the best possible conference, incorporating your special interests, please tick any of the above items which interest you and fax back to (02) 9850 6053. This will enable us to eventually generate a better program and better home-page

Suggestions of associated meetings and workshops, and additional or alternative symposia and excursions: I expect to be able to make a presentation and provide a manuscript for publication on:
Name:
Address:
Telephone
E-mail:

IGCP 410

The final IGCP 410 meeting will be held in Sydney (Australia) in conjunction with the First International Palaeontological Congress (IPC) being organized by JA Talent, R. Mawson & G Brock from 6-10 July 2002. For congress details (2nd Circular and Registration form, see web site:
http://www.ed.mq.edu.au/mucep/ipc2002/
The IGCP 410 meeting and session at the Congress has been programmed for the morning of July 8, 2002, and will involve the following Symposium: "The Response of the Marine Biosphere to Major Changes within the Earth System during the Ordovician"
The symposium will address how the components of the Ordovician marine biota evolved and responded to changes in, and in turn helped modify, the Earth System. The Ordovician biosphere was affected by particular events and conditions of the paleooceans, paleoclimates and paleogeography. Papers are invited that focus on this theme, provide a synthesis or present new regional or global palaeontological data that are related to paleoenvironmental indicators. Organizers (Co-Convenors): Chris R. Barnes, Barry D. Webby and Ian G Percival.

GRAPTOLITES DOWN-UNDER

The first International Palaeontological Convention provides an unique opportunity to visit some of the world's classic graptolite localities. Guided by a formidable team of Australian graptolite researchers, the excursion will concentrate on those localities that are of greatest interest and global importance. To register for IPC2002 and to secure your place on this excursion please refer to the web page: www.es.mq.edu.au/mucep/ and click on the item highlighted as IPC2002 Second Circular. The booking forms can be downloaded for submission.

Papers concerning graptolites will be most welcome in Symposium 21 that is being co-ordinated by Tony Wright.

Post-2: Ordovician-Silurian graptolite succession of southeastern Australia

Leaders: Fons VandenBerg, Tony Wright, Ian Percival, Lawrence Sherwin, Barrie Rickards, Ian Stewart
Dates: 11-17 July 2002
Itinerary: Sydney, to central and southern N.S.W. (Orange, Cowra, Yass), thence to classic Early & Middle Ordovician graptolite succession in central Victoria (Jamieson, Bendigo, Daylesford, Lancefield), departing Melbourne (Tullamarine Airport).
Summary:
July 11: Depart Macquarie University 8.30 am; drive via Blue Mountains (scenic lookout) to Orange for lunch; afternoon stop at Keenans Bridge Quarry (Late Ordovician Cheesemans Creek Formation). Overnight: Orange.
July 12: Visit Silurian graptolite localities south of Orange (Quarry Creek & Four Mile Creek areas) led by Wright, Rickards & Sherwin, with optional visit in afternoon to Gisbornian locality in Canobolas State Forest, and early Bolindian locality at Malongulli Trig, led by Percival & VandenBerg. Overnight: Cowra.
July 13: Drive to Yass via Boorowa; visit Silurian graptolite localities at Rainbow Hill, Derringullen Creek, Elmside; Overnight: Yass.
July 14: Complete Silurian graptolite localities near Yass; drive on Hume Highway from Yass– Albury–Benalla, then to Jamieson via Mansfield**.** Overnight: Jamieson.
July 15: Enochs Point section (early Eastonian); then to Bendigo via Seymour & Heathcote, with one or more Castlemainian graptolite localities en route. Overnight: Bendigo.
July 16: Visit several classic Early and Middle Ordovician graptolite localities en route via Castlemaine to Daylesford. Overnight: Daylesford.
July 17: Visit Early Ordovician (Lancefieldian-Chewtonian) and Middle Ordovician (Castlemainian-

Yapeenian) graptolite localities between Daylesford and Lancefield, via Gisborne. Overnight: Lancefield.
[Lancefield is approx. 45 minutes drive north of Melbourne (Tullamarine) Airport; international air departures could be scheduled for the evening of July 17, or any time on July 18. NSW drivers depart early on July 18 for 10 hour drive back to Sydney, and could take very limited number of passengers].
For those wishing to visit Melbourne City immediately after the excursion, there is the option of including a half-day inspection (morning of July 18) of graptolites and other fossils in National Museum Victoria collections; transport back to Melbourne (Tullamarine) Airport & any other expenses after breakfast on this day are NOT included in excursion cost.
Transport: Minibus and three 4WD vehicles
Accommodation: Economy motel twin share
Limits: Maximum 15 (including accompanying partners)
Cost: 11-17 July - $700; (includes field guide, transport, accommodation for 7 nights with light breakfasts, morning and afternoon snacks, lunches – but NOT evening meals or alcoholic drinks)
Participants: are advised to be prepared for windy, cold (even snowy) or rainy weather – but we could also have crisp sunny days ideal for collecting graptolites.
Further Information:
Ian Percival (Geological Survey of NSW): percivai@minerals.nsw.gov.au
Lawrence Sherwin (Geological Survey of NSW): sherwinl@minerals.nsw.gov.au
Tony Wright (University of Wollongong): awright@uow.edu.au
Fons VandenBerg (Geological Survey of Victoria): Fons.Vandenberg@nre.vic.gov.au

9TH INTERNATIONAL SYMPOSIUM ON THE ORDOVICIAN SYSTEM, 7TH INTERNATIONAL GRAPTOLITE CONFERENCE & FIELD MEETING OF THE SUBCOMMISSION ON SILURIAN STRATIGRAPHY

ARGENTINA
San Juan City, August 18 - 21, 2003

SECOND CIRCULAR
Registration Form is attached (see last page).

FOREWORDS
Knowledge of the Ordovician System in the Argentine Republic originated in the pioneering works of German naturalists who explored West and Northwest Argentina during the second half of the nineteenth century (e.g. Burmeister, Kayser, Stelzner, Brackebusch). Significant advances on the description of Ordovician sequences, and large paleontological collections were done in the early-middle part of the current century. Today there is a fairly good understanding of Ordovician rocks, and some exciting discussions are taking place within the scientific community (terrane displacements and high resolution biostratigraphy in western Argentina).
The Ordovician System of Argentina can be considered as the most complete for South America, taking into account the areal extent and thickness of outcrops, the high variety of lithologies and the development of its biostratigraphic column.
Ordovician rocks are particularly well represented in the three classical study areas of western and northwestern Argentina: the Precordillera, the Famatina System and the Eastern Cordillera. The regional geology of these provinces is characterized by distinctive paleoenvironmental settings and structural styles. The Ordovician System of the Precordillera shows a succession of thick carbonate sequences, black shale facies, flyschoid deposits and glacial marine sediments. The Ordovician of the Famatina System is dominated by restricted anoxic facies, complex volcanic-arc explosive sedimentation and extensive acid magmatism. The Eastern Cordillera exposes a thick pile of Ordovician sequences, from widespread, tidal dominated facies to deep-shelf siliciclastic deposits.
The Ordovician Period in the Argentine basins records major-order sea level fluctuations, extensional and compressional tectonism associated with significant metamorphism, as well as magmatic and volcanic events. Early Paleozoic volcanism, magmatism and metamorphism is well-presented in Central and Northwestern Argentina. Significant episodes of the Ordovician System include the volcano-sedimentary successions of the Famatina and Puna (with related metalliferous mineralization), the calk-alkaline subduction related magmatic arc in the Famatina and the granites emplaced in the Precordilleran basement and the Western Pampean Ranges. Longitudinal outcrops of typical ophiolite sequences (Middle Ordovician) are exposed in Precordillera.
The paleogeographical position of the South American Gondwanan margin, the pattern of oceanic currents and the origin and latitudinal positions of some suspected exotic terranes, along with basinal developments and global paleoceanographic changes, controlled the evolutionary patterns, radiations, extinctions and faunal migratory interplays, as well as the diverse paleobiological provincialism exhibited by these geological provinces during the Ordovician Period.

PLACE AND DATES

The scientific sessions for the 9th International Symposium on the Ordovician System, the 7th International Graptolite Conference and the Field Meeting of the Subcommission on Silurian Stratigraphy will be held in conjunction in San Juan City. The sessions and business meetings of the ISOS are scheduled to take place on August 18-21, 2003, and the IGC & FMSSS are scheduled for August 18-19, 2003.

San Juan City, the Capital of San Juan Province, is located at the foot-hills of the Andes, 800 m above sea-level, in western Argentina, with a population of about 4 hundred thousand inhabitants. In August (winter) the weather could be temperate at noon, but cool the rest of the day. During this season, San Juan is under the influence of a hot wind, called Zonda or, conversely, a cold wind coming from the south. So, during the day, temperature could change dramatically. Climate is dry, as San Juan is placed in a typical desert region, bounded by mountain chains striking north-south. San Juan is a land of fine vineyards and gentle people willing to give our visitors a nice Argentine experience. Most of hotels are concentrated in San Juan downtown, while University Residence is close, about 10 minutes, downtown.

San Juan Province integrates three main Geological Provinces: the Western Sierras Pampeanas, the Precordillera and the Andes Cordillera. The Sierras Pampeanas are characterized by Precambrian metamorphic rocks and intracratonic late Paleozoic, Mesozoic and Cenozoic continental basins. The Precordillera is mainly made up of sedimentary, carbonate and siliciclastic, rocks ranging in age from Lower Paleozoic to Cenozoic. The Andes Cordillera includes the Frontal and Principal morphostructural segments, composed, the first one, mainly of Late Paleozoic sedimentary rocks, Triassic and Neogene volcanic rocks; while the second one includes mostly Mesozoic sedimentary deposits.

In the Eastern and Central Precordillera, the Lower – Middle Ordovician stratigraphy is characterized by platform deposits, made up of restricted to open shelf carbonate deposits, which bear an almost complete conodont, brachiopod and trilobite biozonal record, and reefal structures. The carbonate sequence is overlain by a mixed calcareous/shaly package, with a fine graptolite biostratigraphy. Platform faunal records have strong affinities with those from the southeastern margin of Laurentia. The carbonate bank is succeeded by mixed siliciclastic-carbonate sequences, including graptolites, conodonts and a rich shelly fauna. The Western Precordillera displays deep-water facies, represented by Cambrian to Early Ordovician rocks re-deposited during the Late Ordovician, as well as autochthonous Late Ordovician black shales with graptolites, and turbidite deposits, mafic intrusive rocks and tholeitic pillow basalts. The Silurian System consists of heterolithic siliciclastic rocks with significant fossil assemblages, being well represented in the Eastern and Central Precordillera.

ORGANIZING COMMITTEE

ISOS

Honorary Chair: MARIO A. HÜNICKEN (National Academy of Sciences, Córdoba)

Chair: FLORENCIO G. ACEÑOLAZA (CONICET, National University of Tucumán)

Vice-chairs: SILVIO H. PERALTA (CONICET, National University of San Juan) & GUILLERMO L. ALBANESI (CONICET, National University of Córdoba)

Secretary: MATILDE S. BERESI (CONICET, CRICyT, Mendoza)

IGC

Honorary Chair: ALFREDO J. CUERDA (National University of La Plata)

Chair: GLADYS ORTEGA (CONICET, National University of Córdoba)

Vice-chair: JUAN CARLOS GUTIÉRREZ MARCO (Complutense University, Madrid, Spain)

Secretary: GUILLERMO F. ACEÑOLAZA (CONICET, National University of Tucumán)

ISOS – IGC – FMSSS

Treasurer: SUSANA B. ESTEBAN (National University of Tucumán)

Co-treasurer: M. FRANCO TORTELLO (CONICET, National University of La Plata)

Accommodation & social events coordinator: ALDO L. BANCHIG (CONICET, National University of San Juan)

Technical program coordinator Field Meeting SSS: MICHAEL J. MELCHIN (St. Francis Xavier University, Antigonish, NS, Canada).

REGISTRATION AND COSTS

The registration fee for participants includes: attendance to all scientific sessions, volume of short papers, ice breaking party, coffee or tea breaks twice a day, closure dinner, and an intra-symposia field trip.

Prices:

ISOS-IGC-FMSSS: US$ 300.- (after deadline, US$ 350.-).

Students: US$ 70.- (after deadline US$ 100.-), without proceedings volume.

Accompanying person: US$ 70.- (after deadline US$ 100.-), without proceedings volume.

For those participants not attending the meetings, but willing to submit a paper as co-author, the registration

cost is US$ 20 for each paper, including the reception of the proceedings volume in CD-ROM.
Registration Deadline: December 15, 2002.

Payments (registration fee, field trip fee, university residence)*

Foreign participants should pay by bank transfer to:
Citibank N.A. - New York
International Personal Banking (IPB)
666 Fifth Avenue, 7th floor
New York, NY 10103 – USA -
Account number: 69497975
ABA Nº 021000089
SWIFT code CITI US 33BR465
Count holder: Florencio Aceñolaza

Argentine participants should pay to:
Banco de la Nación Argentina
Sucursal La Ciudadela (Tucumán) – 2141/48
Caja de Ahorro Nº 314112983/2
Titulares de la Cuenta: Susana Esteban – Florencio Aceñolaza

* Please, just after payment send a message to Susana Esteban (treasurer) confirming your transfer, fax: 0054-381-4236395, or e-mail: insugeo@unt.edu.ar

PROVISIONAL SCHEDULE

August 12th (Tuesday)
Reception of the pre-symposia field trip participants at San Juan City.

August 13th - August 17th
Pre-symposia field trip to Precordillera (San Juan and Mendoza provinces)

August 17th (Sunday)
Afternoon: Registration. Evening: Ice breaking party at San Juan City.

August 18th (Monday) - ISOS and IGC-FMSSS
Morning: Scientific sessions and poster presentations. Afternoon: Scientific sessions, poster presentations.

August 19th (Tuesday) - ISOS and IGC-FMSSS
Morning: Scientific sessions and poster presentations, and IGC workshop. Afternoon: Scientific sessions, poster presentations, and business meeting SOS.

August 20th (Wednesday)
Intra-symposia field trip (San Juan River section).

August 21st (Thursday) - ISOS
Morning: Scientific sessions and poster presentations. Afternoon: Scientific sessions, poster presentations, and business meeting SOS. Evening: Closure dinner.

August 22 nd (Friday)
Morning: Flight from San Juan to Salta City.

August 22nd - August 26th
Post-symposia field trip to Eastern Cordillera (Salta and Jujuy provinces).

August 27th (Wednesday)
Departure from Salta City.

INSTRUCTION TO PRESENTERS

Conference Language
English

Oral Presentation
Each participant will be able to contribute only one oral presentation. Contributions in excess of expected number may be accepted as posters by the Organizing Committee. Each oral presentation will have a maximum duration of 15 minutes with 5 additional minutes for questions and discussion. Video projectors, overheads, and 35 mm slide projectors will be available for speakers.

Poster Presentation
The poster will consist of a single sheet size A0 (90 cm wide x 120 cm high). The upper 30cm will include the title, name and address of the authors. The title will have 3 cm high characters in 100 points, the names in 50 points and the location in 30 points. The lower area will include the text and illustrations. The size of the characters will be 24 points or more. Each poster presentation will be allocated 3 hours.

Publication
A short-paper volume will be published and given at San Juan. An alternative publication on digital media (CD-ROM) will be delivered to all registered participants not attending the events. Field trip guidebooks will be distributed to all participants enrolled in the field trips.
All the papers will be refereed by the Scientific Committee. Oral or poster presentation must be chosen by the authors.
A short-paper volume will be published as a special issue of "Serie de Correlación Geológica, Instituto Superior de Correlación Geológica, CONICET, Universidad Nacional de Tucumán" (visit web site: www.unt.edu.ar/fcsnat/INSUGEO).
Each participant will be permitted to submit up to 2 papers as first author, and a maximum of 4 papers as co-author.
Manuscript format: each contribution should not exceed 6 A4 pages. Full text should be typed in font Times New Roman, standard, size 11, double space, 1 column, justified (margins -in cm: 2 up, 2 down, 3

left, 3 right). Title: capital case, bold type, size 12. Author names: lower case, size 11. Text headings: bold lower case, size 11. References, addresses and figure captions, size 10. Up to 3 figures with captions are permitted (line drawings and 1 plate, box: 20 x 13 cm maximum). Text should be saved in Word or RTF formats, and figures as .jpg or .tif formats. The author should mark in the manuscript where figures may be inserted. Final layout of papers will be prepared by publisher.

Assemble your manuscript including:

- Title
- Author/s
- Address/es
- Introduction
- Text headings
- Conclusions
- References

Reference example:

Baldis, B. 1992. Marco estructural de las cuencas del Paleozoico Inferior sudamericano en su contexto gondwánico. *In*: Gutiérrez Marco, J.C., Saavedra, J. and Rabano, I. (eds.), *Paleozoico Inferior de Ibero-América,* Universidad de Extremadura, España: 1-19.

Harrington, H.J. and Leanza, A.F. 1957. Ordovician trilobites of Argentina. Department of Geology, University of Kansas, Special Publication 1, University of Kansas Press, Lawrence: 1-276.

Hughes, C.P., Rickards, R.B. and Williams, A. 1980. The Ordovician fauna from Contaya Formation of eastern Perú. *Geological Magazine,* 117(1): 1-21.

Manuscript should be submitted as e-mail attachment to the following addresses:

ISOS: <mberesi@lab.cricyt.edu.ar>

IGC-FMSSS: <gcortega@arnet.com.ar>

E-mail message should include: full name, address, fax and e-mail of the responsible author for the galley proofs, and title of the attached paper.

Deadline for submission of papers: December 15, 2002 (registration payment is required on this deadline for those participants intending to submit a paper).

♦ The Organizing Committee is evaluating the offer to publish a post-symposia volume with selected papers in *Geologica Acta*, University of Barcelona, Spain.

FIELD TRIPS

Three field trips are scheduled for the *9th ISOS, 7th IGC, and Field Meeting SSS.*

Those intending to participate in the pre or post-symposia field trips should submit a deposit of US$ 100 for each excursion by **December 15, 2002,** to ensure a place.

Deadline for field trip/s full payment: May 15, 2003.

1) Pre-symposia Field Trip - Precordillera (San Juan and Mendoza provinces) -

August 13-17, 2003.

Price: US$ 300.- includes transportation, guidebook, and lunch and snacks from the morning of the 13th to the noon of the 17th (without hotel, to be booked by participants in San Juan City).

The Precordillera excursion is planned for a minimum of 15 and a maximum of 40 participants.

Leaders ISOS: SILVIO H. PERALTA (CONICET, National University of San Juan) & FERNANDO CAÑAS (CONICET, National University of Río IV).

Leaders IGC-FMSSS: EDSEL D. BRUSSA (CONICET, National University of La Pampa) & GLADYS ORTEGA (CONICET, National University of Córdoba).

The Argentine Precordillera is a unique site to examine a very complex geology throughout the Early Paleozoic. The Ordovician System of the Precordillera, including significant carbonate and siliciclastic sequences, is probably the best well-known in South America, while controversial hypotheses regarding its paleogeographic origin were proposed and debated during the last decade. Dynamic research on the Precordillera makes all geological subdisciplines provide updated information. A rich database is available from different paleontological groups, including a comprehensive conodont-graptolite biostratigraphy.

Following localities will be visited (stops/day): 1) San Isidro Creek, (Cambrian, Ordovician), 2) Villicum Range (Ordovician, Silurian), 3) La Chilca Hill (Ordovician, Silurian), 4) Niquivil - La Silla Hill , and Los Gatos section at Viejo Hill (Cambrian, Ordovician), 5) Talacasto - La Invernada Range - Jáchal River section (Cambrian, Ordovician, Silurian). Sections that include different carbonate and siliciclastic sequences of the Cambrian, Ordovician and/or Silurian systems, bearing graptolite assemblages and diverse invertebrate fossil groups, as well as ichnoassemblages, will be visited every day.

2) Intra-symposia Field Trip - San Juan River -

August 20, 2003.

Price: included in the registration fee.

Leaders ISOS-IGC-FMSSS: SILVIO H. PERALTA (CONICET, National University of San Juan) & OSVALDO L. BORDONARO (CONICET, National University of San Juan).

This classical section, throughout the spectacular landscapes of the San Juan River, is the option for the one-day field trip because of its direct access from San Juan City. Driving along the road connecting San

Juan and Calingasta, after crossing over the thick Cambrian carbonates it is possible to look at a thick overthrust of the San Juan Formation (mostly Arenig) in the eastern sector. Extensive siliciclastic deposits of the Alcaparrosa Formation (Upper Ordovician), including oceanic floor mafic rocks will be seen in the western part. Peculiar carbonate facies could be seen at the Sassito River section (Upper Ordovician). Also, significant siliciclastic sequences of Silurian age, and fossil assemblages will be shown during the trip.

3) Post-symposia Field Trip - Eastern Cordillera (Salta and Jujuy provinces) -

August 22-26, 2003.

Prices for parallel field trips, *ISOS* and *IGC-FMSSS*, includes air tickets from San Juan to Salta, and cover all costs from August 23-26 (hotel, meals and transportation –including the night of the 26th).

The Eastern Cordillera field trip is planned for a minimum of 15 and a maximum of 30 participants.

Selected localities within landscapes of dense tropical rain forest, and dry areas as the Humahuaca Creek (where some Inca architectural remains are superbly preserved) will be visited. This field trip is devoted to look at some reference sections of the Gondwanan margin of South America. They integrate thick siliciclastic sequences reaching up to 7000 m through the Cambrian-Ordovician systems. Highly fossiliferous sections will be shown (graptolites, trilobites, brachiopods, conodonts, ichnofossils) discussing paleoenvironmental settings and biostratigraphical markers for the different subdivisions of the Ordovician System in the basin. In particular, a typical locality of the Subandean Ranges, including the Ordovician – Silurian transition with glacial deposits, southeast of Eastern Cordillera is incorporated.

ISOS excursion

Price: US$ 800.- Contact: GUILLERMO F. ACEÑOLAZA, e-mail: acecha@unt.edu.ar

Leaders: GUILLERMO F. ACEÑOLAZA (CONICET, National University of Tucumán) & M. FRANCO TORTELLO (CONICET, National University of La Plata).

Classical localities of the Ordovician System of Northwestern Argentina will be visited, showing their stratigraphy, paleontology and regional geology, and discussing basin dynamics, paleogeography and changing geometries within this Gondwanan margin.

Following localities will be visited (stop/day): 1) San Bernardo Hill and La Pedrera locality at Mojotoro Range (Cambrian - Lower Ordovician), 2) 9 de Octubre Mine, Zapla Range (Upper Ordovician – Lower Silurian), introduction to Humahuaca Creek (Cambrian - Lower Ordovician). 3) Purmamarca Area: Salto Alto, Coquena and Chalala creeks (Lower Ordovician). Indian Fortress at Tilcara Town, Huasamayo River, Chucalezna, Moya and Sapagua creeks (Cambrian - Lower Ordovician). 4) Angosto del Moreno Area (Cambrian, Lower - Middle Ordovician). 5) Alfarcito Area: Casa Colorada Creek (Cambrian - Lower Ordovician). Alternatively, a short visit to the Cajas Range for a limited number of people is being considered (Upper Cambrian, Lower - Middle Ordovician).

IGC-FMSSS excursion

Price: US$ 800.- Contact: GLADYS ORTEGA, e-mail: gcortega@arnet.com.ar

Leaders: M. CRISTINA MOYA (CONICET, National University of Salta) & GLADYS ORTEGA (CONICET, National University of Córdoba).

Particular emphasis will be devoted to most accessible and complete sections with graptolites, and associated faunas, in the stratigraphic and paleoenvironmental frameworks of the Ordovician and Silurian systems of the Eastern Cordillera and Subandean Ranges.

Following localities will be visited (stop/day): 1) San Bernardo Hill and sections of the Mojotoro Range (Cambrian - Lower Ordovician). 2) 9 de Octubre Mine, Zapla Range (Upper Ordovician – Lower Silurian), Yala lakes (Lower Ordovician). 3) Purmamarca Area: La Cienaga, Coquena and Chalala creeks (Lower Ordovician). 4) Angosto del Moreno Area (Cambrian, Lower - Middle Ordovician). 5) Indian Fortress at Tilcara Town, Huasamayo River, and Grande River at Humahuaca Creek (Cambrian - Lower Ordovician), Cornisa Road and Gallinato Creek of the Mojotoro Range (Lower – Middle Ordovician).

Important: Please, note that in the post-symposia field trip to Eastern Cordillera, and the proposed Puna Geological Province of Northern Argentina, we will be going up to 3500 m above sea level. Health insurance is highly recommended for all participants.

ADDITIONAL FIELD TRIPS

The Organizing Committee offers the following alternative field trips, albeit to be confirmed by respective leaders, depending on a minimum number of interested participants:

Previous to Precordillera Field Trip

San Rafael Block (Mendoza Province)

Leaders: CARLOS A. CINGOLANI (CONICET, National University of La Plata) & SUSANA E. HEREDIA (CONICET, National University of Comahue).

Siliciclastic pro-delta facies of the Arroyo Pavón Fm. (500 m thick) bear distinctive graptolite assemblages from the *C. bicornis* Zone. In neighboring outcrops different sections of the Ponón Trehue limestones yielded Lower to Middle Ordovician conodont associations similar to those of correlative facies from the Precordillera. The San Isidro locality, showing diverse Cambrian to Upper Ordovician rocks and faunas, will be visited in connection with the field trip to the Precordillera.
Contact: CARLOS A. CINGOLANI, e-mail: carloscingolani@yahoo.com

Paraguay
Leaders: JULIO C. GALEANO INCHAUSTI (Mineral Resource Office from Paraguay) & DANIEL POIRÉ (CONICET, National University of La Plata).
Ordovician and Silurian siliciclastic sequences from the eastern Paraguay region composed by Caacupé and Itacurubí groups will be visited. Excellent well-preserved ichnofossil assemblages, trilobites, brachiopods, bivalves and other invertebrates will be observed in shallow marine and shelf deposits. Paraguarí, Piribebuy, Caacupé, Ypacaraí, Tobatí, Eusebio Ayala, Itagua Vargas Peña, e Itacurubí de la Cordillera will be visited during the field trip.
Contact: DANIEL POIRE, e-mail: poire@cig.museo.unlp.edu.ar

After Eastern Cordillera Field Trip
Tandilia System (Buenos Aires Province)
Leader: DANIEL POIRÉ (CONICET, National University of La Plata).
Cambro-Ordovician sequences, related to the Andean and South African basins are recorded. Interesting ichnofossil associations can be observed in these units, cropping out in the southern region of Buenos Aires Province.
Contact: DANIEL POIRE,
e-mail: poire@cig.museo.unlp.edu.ar

Puna (Salta and Jujuy provinces)
Leader: JOSÉ VIRAMONTE (CONICET, National University of Salta).
This high plateau, over 4000 m altitude, records shallow water siliciclastic rocks related to an evolving volcanic arc (Lower Ordovician), covered by thick turbiditic volcaniclastic successions (Lower-Middle Ordovician), and typical Gondwanan faunas. The planned field trip includes a main transverse section reaching the Argentine-Chilean border.
Contact: JOSÉ VIRAMONTE,
e-mail: viramont@unsa.edu.ar

Bolivia
Leaders: Sven Egenhoff (Technische Universität Bergakademie Freiberg, Germany) & Bernd-D. Edtmann (Technical University Berlin, Germany). Following localities will be visited (stops/day): 1) Focus on the Sama and Sella localities near Tarija. Introduction into the general geology of southern Bolivia, graptolite stratigraphy, and glacial deposits of the Ashgill Cancañiri Formation. 2) Iscayachi and Cieneguillas localities, Lower Ordovician graptolite stratigraphy. 3) Tacsara, Toyo and Tupiza localities, uppermost Cambrian to lowermost Ordovician evolution at Tacsara, graptolite stratigraphy in the Lower and Middle Ordovician. 4) Localities at San Vicente, Rio Marquina and Mina Chilcobija in the western part of the Eastern Cordillera. Upper Ordovician, graptolite deep-water faunas. 5) Localities north of Tupiza, Mal Paso, Abra Negra and Chaupiuno, turbiditic ramp and distal prodelta facies in the central Eastern Cordillera, upper Arenig graptolite faunas and biostratigraphy, ichno- and fossil assemblages in prodelta settings.
Contact: SVEN EGENHOFF,
e-mail: sven.egenhoff@geo.tu-freiberg.de

ACCOMMODATION
Hotel of different prices will be selected (single and double rooms, US$ 15-100+) in San Juan City. Bookings are to be made by participants directly with hotels. Accommodation in the University Residence will be reserved for young scientists and people from less favored countries.
Hotels (preliminary list by category*)
- ALKAZAR 5* - Single: US$ 100. E-mail: reserva@alcazarhotel.com.ar
- NOGARÓ 3* - Single: US$ 69, Double: US$ 79. Http://www.inaut.unsj.edu.ar/hotel_nogaro.htm. Tel.: 54-(0)264-4227501
- CAPAYAN 2* - Single: US$ 40, Double: US$ 45, Triple: US$ 50. E-mail:hcapayan @ infovia.com.ar. Tel.: 54-(0)264-4214222/4225442)
- PLAZA 2* - Single: US$ 30. Tel.: 54-264-4225179
- BRISTOL 2* - Single: US$ 30. Http://www.enriqueu.com.ar
- JARDÍN PETIT 2*- Single : US$ 30. Http://jardinpetithotel@hotmail.com.ar
- SELBY 2* - Single: U$S 10-20. E-mail: hotelselby@sinectis.com.ar. Tel.: 54-(0)264-4224777
- ALHAMBRA 2* - Single: US$ 10, Double: $ 20. Tel.: 54-(0)264-4214780
- AMERICA 1* - Single: US$ 15. E-mail: hotelam@impsat1.com.ar
- BRESCIA 1* - Single: US$ 10. Tel.: 54-(0)264-4225708

Apart Hotels
- POSADA DEL SOL - Double: US$ 20. E-mail: posadadelsol@yupimail.com. Tel.: 54-(0)264-4262216
- EL PASO - Single: US$ 10-20. E-mail: caputto@arnet.com.ar
University Residence
Single: US$ 11. Double: US$ 20

For further information regarding accommodation, please, contact: ALDO L. BANCHIG, e-mail: abanchig@lab.cricyt.edu.ar

Social Events
A social program for participants and accompanying persons will be announced in the third circular. It will include a tour around San Juan city, sight-seeing Precordilleran landscapes surrounding the city, vineyards and wine cellars.

Letter of Invitation
In case an official document is needed to confirm participation or help to get funds for travel and attendance, please contact the secretariat.

Visa and Insurance
Participants should check whether a Visa is necessary, being responsible for their own Visa arrangements (a letter from the Organizing Committee will be given upon request).
Participants are highly encouraged to purchase health and travel insurance prior to departure.

Expected Weather
August is usually quite cold (as it is expected, at that time we are in winter in the southern hemisphere). Expect 5º to 15º Celsius and no snow, if we are lucky we will have between 15º to 20ºC. Days are short (getting dark at about 19 hs.), we will try to use all daylight in our activities. Rain is not usually expected. We suggest you to get well dressed for winter time.

CORRESPONDENCE
Please, for ISOS contact to:
MATILDE S. BERESI, IANIGLA-CRICYT, Av. Ruiz Leal s/n, Parque Gral. S. Martín, (5500), Mendoza, ARGENTINA, e-mail: mberesi@lab.cricyt.edu.ar, http://www.cricyt/ianigla.edu.ar, tel: 00 54-(0)261-4287029, fax: 00 54-(0)261-4285940
Please, for IGC-FMSSS contact to:
GUILLERMO F. ACEÑOLAZA, INSUGEO, Miguel Lillo 205, 4000 Tucumán, ARGENTINA, e-mail: acecha@unt.edu.ar (alternative e-mail: insugeo@unt.edu.ar), tel./fax: 00 54-(0)381-4253053
Other contacts:
ISOS - GUILLERMO L. ALBANESI, Museo de Paleontología, Universidad Nacional de Córdoba, Casilla de Correo 1598, 5000 Córdoba, ARGENTINA, e-mail: galbanesi@arnet.com.ar, tel.: 00 54-(0)351-4718655, fax: 00 54-(0)351-4216350.
IGC-FMSSS - GLADYS ORTEGA, Museo de Paleontología, Universidad Nacional de Córdoba, Casilla de Correo 1598, 5000 Córdoba, ARGENTINA, e-mail: gcortega@arnet.com.ar, tel.: 00 54-(0)351 4718655, fax: 00 54-(0)351-4216350.

Important Dates
- Deadline to answer the second circular, payment of lower registration fee (mandatory for submission of paper/s), submission of papers to be reviewed, and deposit for field trips: ***December 15, 2002.***
- Field trips full payments: ***May 15, 2003.***
- The third circular with the final program will be distributed in ***June 2003*** *to participants who reply to the second circular.*

Please, find a link to all forthcoming information at:
http://www.cricyt.edu.ar/congresos/2003/default.html

PROJECTS

THE GREAT ORDOVICIAN BIODIVERSIFICATION EVENT

Annual Report of IGCP Project No. 410:
Duration and status: Project accepted for five years (1997-2001) plus one-year extension to 2002

Project leaders:
1. Barry WEBBY
   Centre for Ecostratigraphy and Palaeobiology, Department of Earth & Planetary Sciences, Macquarie University, North Ryde, NSW 2109, Australia; fax: Int. code + 61 (2) 9850 6904; e-mail: bwebby@laurel.ocs.mq.edu.au
2. Florentin PARIS
   UPR du CNRS "Géosciences", 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, Riverside, CA 92521, U.S.A.; fax: Int. code + 1 (909) 787 4324; e-mail: mary.droser@ucr.edu

IGCP Project No. 410 Web-sites:
http://www.es.mq.edu.au/MUCEP/igcp410.htm [project web-site]
http://homepages.uc.edu/~millerai/welcome.html [database web-site]

1. Summary of major past achievements of the project

IGCP 410 is the first IGCP project to highlight exclusively Ordovician rocks and fossils, and to maintain a truly global focus in its work programs. Significant progress has been made since 1997, in studies of Ordovician biodiversity and related topics, in the following four main areas: (1) the collection and coordination of biodiversity data down to species level, along with the differentiation of biofacies patterns, within a framework of coordinated work programs by seven regional teams (Europe/N Africa; Baltoscandia; China/Korea; Kazakhstan/Siberia; N America; Australasia; S America); (2) in a complementary global work program, the compilation and analysis of the global distribution patterns of all the independent clade (taxonomic) groups in Ordovician time and space; (3) the development of a wholly integrated stratigraphic framework to provide a more reliable basis for global and regional correlation; and (4), the adoption of a user-friendly, web-based relational database for input of all relevant biotal data, as well as geographic, stratigraphic and environmental information. Numerous publications - well in excess of 100 papers on Ordovician biodiversity topics - have been derived from the IGCP 410 programs of work (details listed in earlier annual reports).

In summary, major progress has now been made by the **regional teams,** especially those in Europe/N Africa, China/Korea, Australasia and in Baltoscandia, and the individual **clade** teams are continuing to make excellent progress in the lead up to the major IGCP 410 clade-group meeting to be held in the University of California at Riverside in 2001 (reported below). Efforts have also continued to be made to establish a more highly integrated global stratigraphic framework for the correlation work. Also, an Ordovician-focused, web-based relational, global **database**, developed by Arnie Miller at the University of Cincinnati (U.S.A.), became available to IGCP 410 participants to input their biotal and other relevant data..

Seven international IGCP 410 meetings were organized to the end of 2000, across a wide range of venues - in St Petersburg (Russia) with an accompanying field trip during 1997, in Lyon (France), Seoul (South Korea) and Nanjing (China), with associated Korean and Chinese field trips, during 1998, in Prague (Czech Republic) with accompanying field trips in 1999, and in Orange (Australia) with an associated field trip, and Rio de Janiero (Brazil) during 2000. All these meetings were well attended by Ordovician scientists, and especially well supported by our scientific hosts in their institutions. Scientists from some thirty seven different countries actively participated in the work programs. IGCP 410 has also maintained continuing, fully collaborative, and supportive links with the IUGS Subcommission on Ordovician Stratigraphy, particularly in relation to the global time scale work, and with other relevant IGCP projects, in particular No 421 (North Gondwana Mid-Palaeozoic biodynamics).

2. Achievements of the project this year

2.1. Revised list of countries involved in the project

*(*indicates those active this year)*

Algeria*, Argentina*, Australia*, Austria, Belarus, Belgium*, Bolivia, Brazil*, Bulgaria*, Canada*, People's Republic of China*, Czech Republic*, Denmark*, Estonia*, France*, Germany*, Ireland, Italy*, Iran, Kazakhstan, Republic of Korea*, Mongolia*, Morocco*, New Zealand*, Norway*, Poland*, Portugal*, Puerto Rica, Russia*, Saudi Arabia*, South Africa, Spain*, Sweden*, Vietnam, United Kingdom*, United States*, Uzbekistan.

2.2. General scientific achievements (including societal benefits)

This year IGCP 410 held its eight, ninth and tenth international meetings on aspects of Ordovician biodiversity - first, there was a clade team meeting in Riverside (California, U.S.A), and then the two field meetings, in Novosibirsk and the Siberian Altai (Russia), and in Ulaanbaatar and southern-central Mongolia, respectively. All these meetings were well attended and productive, and as in previous years have been largely supported by finances provided by UNESCO and IUGS. They were meetings held in areas not previously visited, which had the effect of widening our regional focus on Ordovician biodiversity to other parts of Asia. Most of our regional team work programs continued to make some progress, but the European/North African team was again the most active and productive. In some areas of Europe, for example, in the Czech Republic, the biodiversity work program has now virtually been completed, with the results of particular importance because they show patterns of diversity in marine environments of higher paleolatitudes through Ordovician time. Again, this year, a very large number of papers have been published on Ordovician biodiversity and related topics by participants of IGCP 410 worldwide (see details listed below).

The clade team meeting held in Riverside last June (and more fully reported below) brought together the leading Ordovician experts worldwide for presentations of their clade group specialities, but also to join in wider discussions about how the major results of this IGCP 410 team work should be published. It was agreed that all the biodiversity

results should employ the same standardized global time scale, and use the same diversity measures for plotting patterns of diversity change. We have continued to work towards providing the most highly resolved and well calibrated Ordovician time scale for correlating the biodiversity data, and this year, with the calibration work of Peter Sadler (Riverside, California) and Roger Cooper (Lower Hutt, New Zealand), was advanced further by a computer-generated constrained optimization program that achieved even greater refinement. Sadler and Cooper's startling results were presented at the Riverside meeting. Agreement was also reached at the Riverside meeting that we should apply the same types of diversity measures to all clade groups in the global survey. Consequently, we now have the basis for fullest possible analyses of all the Ordovician clade groups using the same time scale, and the same diversity measures, which will remove at least two serious sources of error in assessing on a group-by-group basis, diversity trends of each major taxonomic group.

The project has added significantly to global efforts to achieve a more highly resolved time scale, and has provided a dramatically increased awareness of the significance of the greatest sustained diversification of marine life on earth.

2.3. List of meetings with approximate attendance and number of countries

2.3.a. Ordovician clade group meeting, University of California (Riverside, USA)

The eighth international meeting of IGCP 410 was held in the University of California, Riverside, from 22-24 June. It was organized by Co-Project Leader M. Droser and her Riverside colleagues with a focus on global and regional patterns of Ordovician biodiversity and, in particular, presentations of work programs by our IGCP 410 clade teams. Over the three days of the meeting, 35 talks and posters were presented, covering a wide range of global and regional biodiversity topics including the following clade groups - acritarchs, brachiopods, bryozoans, chitinozoans, corals, echinderms, graptolites, machaeridians, radiolarians, stromatoporoids trace fossils, trilobites and vertebrates - as well as a contribution on a more fully integrated Ordovician time scale. Some 45 scientists from 13 different countries participated in this well organized, intensive and most productive meeting. A 14-page book of abstracts was published as a special issue of *PaleoBios* by the Museum of Paleontology, University of California, Berkeley.

Just before the meeting we were advised by the Science Editor of the Columbia University Press that our book plan for the publication of the clade team results had been accepted - a single volume to be entitled "The Great Ordovician Biodiversification Event", and to appear in the publishers "Perspectives in Paleobiology & Earth History Series". This volume will be edited by the three IGCP 410 Project Co-Leaders, B.D. Webby, M. Droser and F. Paris. Consequently, wide ranging discussions were held on topics such as: contents, authorship, timetable and deadlines, publishers guidelines, global time scale and diversity measures to be employed. The book will comprise: (1) an introductory section with brief outlines relating to Ordovician time and the Ordovician world (topics such as plate tectonics, paleoclimates, paleooceanography, sea levels, isotope signatures, volcanism, orogeny, a possible superplume, and end-Ordovician glaciation); (2) about 35 chapters documenting the diversity patterns of the clade groups (with more than 50 authors); and (3) a concluding part, with one or more, summary-type global biodiversity syntheses. We expect a published book of about 370 pages, with publication during 2003.

Two high-quality posters were prepared by two of the Project Co-Leaders prior to the Riverside meeting mainly for display purposes, including the Riverside meeting. They each highlighted the progress made by IGCP 410 in evaluating the greatest ever diversification of marine life on earth. The first was prepared by Barry Webby at the request of Professor Ed Derbyshire, Chairman of the IGCP Board, in order to publicize the nature, range and selected recent results of IGCP, and to be available for display at important scientific meetings worldwide over the next few years. The 1200-word text of this poster was sent to Prof. Derbyshire who edited it prior to exhibiting it with others prepared by other selected IGCP projects at the Penrose Earth systems meeting in Edinburgh, Scotland, in the latter part of June. When completed it included, three figures - a generalized diagram to show the pattern of generalized biodiversity change through Early Palaeozoic time, an Ordovician time scale, and a global palaeogeographic map with locations of our previous IGCP 410 meetings also indicated. Altogether it covered an area about 700 mm high by 630 mm wide.

The second poster, prepared by Florentin Paris, was a superbly presented, illustrative display of global maps, photographs of significant Ordovician sections, IGCP 410 venues and participants, Ordovician biotas, a global zonal time-scale, diversity plots through Ordovician time, and a brief text that focused on the goals, organization, results, achievements and collaborative activities. This

laminated poster (in two sheets) measured approximately 1680 mm wide by 1190 mm high.

2.3.b. Combined IGCP 410 and 421 field meetings to south-west Siberia and southern and central Mongolia

Siberia: The first of the two meetings to be held in conjunction with IGCP 421 (North Gondwana Mid-Palaeozoic biodynamics) was organized by the Institute of Petroleum Geology of the Siberian Branch of the Russian Academy of Sciences [SB RAS], Novosibirsk, and FGUO "Zapsibgeols'emka" of the Ministry of Natural Resources of Russia, Novokuznetsk. The co-sponsors included the Presidium of the Siberian Branch of the Russian Academy of Sciences, the Russian Foundation for Basic Researches and the National IGCP Committee of Russia. The field trip from 5 to 19 August focused on: (1) aspects of Ordovician to mid-Palaeozoic sequences and biotas in relation to transgression/regressions events; (2) relationships between the clastic and carbonate facies development, and community associations in the shelf margins of the Siberian block during Ordovician to mid-Palaeozoic time; and (3) to testing recent ideas about how (and when) the mosaic of accreted terranes of Altai-Sayan folded area became a part of the shelf margin of the Siberian craton.

The 40 or so participants included representatives from 9 different countries. An excellent field guide was assembled for this meeting, and topographic maps were also readily available. The field excursion involved travel into a large area to the south and east of Novosibirsk - in the Altai Mts, Salair and the Kuznetsk Basin - a distance of more than 4000 km was covered on the trip using 4-wheel drive vehicles throughout, and camping most nights. The weather remained fine throughout. In some places the field party split into two groups - Ordovician-Silurian, or Late Silurian-Early Carboniferous - dependent on the interests of participants. During the first few days in the North-West Altai there were opportunities to examine the mainly Caradocian and Ashgillian clastic successions with their mixed graptolite and shelly faunas, as well as a deeper water succession of Early Ordovician age with associated radiolarians and conodonts. And later, in the Central Altai, the Ordovician-Silurian group examined the shallow-water Tremadocian succession at Kamlak Creek, containing brachiopods, trilobites and conodonts. Other Ordovician localities were visited in the second half of the field trip, in North-East Salair (near Gur'yevsk). Sections at these isolated localities included: (1) across the Late Cambrian to Early Ordovician transition, some particularly rich trilobite associations identified by Petrunina, (2) a Middle Ordovician succession with key graptolite species, and (3) richly diverse shelly faunas (especially trilobites) in a long-celebrated, Caradocian to early Ashgillian sequence (Weber Formation). The trilobite localities have long been focus of the very painstaking, intensive studies by one of the field leaders, and principal palaeontologist in Novokuznetsk, Dr Z.E Petrunina. It is to be hoped that our visit will provide the necessary stimulus to find a way to get enough funds to help her publish the huge illustrated manuscript she has compiled on the Cambrian-Ordovician trilobite faunas of south-west Siberia.

A particular highlight of field trip was the stopover in Novokuznetsk on 13 August, en route between the Altai Mts and Salair. This stop provided an opportunity to visit the facilities of the well equipped and dynamic Russian Geological Survey (Zapsibgeols'emka) of the Ministry of Natural Resources of Russia, including the palaeontological laboratories and the parts of the organization responsible for producing a range of high quality geological maps (at scales of between 1:10,000 to 1: 200,000). We were warmly welcomed, though the visit was all-too-brief, given the excellence of the scientific work being undertaken at this dynamic institution.

A technical session of oral and poster presentations formed the concluding part of the field meeting in Novosibirsk, at the Institute of Petroleum Geology (IPG) of the Siberian Branch of the Russian Academy of Sciences, on 20 August. Presentations included reports by Tanja Koren' (VSEGEI, St Peterburg) on the future of palaeontology into the 21st century, and by Alexander Kanygin (IPG, Novosibirsk) who argued that the ozone screen of the Earth's atmosphere developed in the Ordovician, and consequently triggered the great Ordovician diversification event. We are especially grateful to Academician A.E. Kontorovich, Director of IPG (Novosibirsk), and to Dr A.N Metsner, Director of Zapsibgeols'emka (Novokutnetsk) for their active supporting this meeting. We also particularly thank our excursion leaders, E.A. Yolkin, A.V. Kanygin, A.A. Bakharev, N.V. Sennikov, N.G. Izokh, O.T. Obut and A.A. Alekseenko (Novosibirsk), and Z.E. Petrunina and O. P. Mesentseva (Novokuznetsk), as well as the cooks, drivers and other supporters in the field. We enjoyed the hospitality of our Russian hosts, and their signifcant contributions in the field. Consequently, this was a most enjoyable and scientifically productive meeting. (I acknowledge help in the preparation this report from J.A. Talent and L. Sherwin)

Mongolia: This joint IGCP 410/421 field meeting commenced with a one-day indoor meeting in Ulaanbaatar on 22 August in the Conference Hall of the Mongolian Technical University, where we were a warm welcomed by the University's President, Prof. D. Badarch. A session of ten talks and a poster were then presented by the delegates, that covered a wide range of topics relating to Ordovician biodiversity, North Gondwanan mid-Palaeozoic bioevents, biogeographic affinities, taxonomy (Asian charophytes) and Mongolian crustal (magmatic) events. Particularly relevant were the papers dealing with the Ordovician biodiversity of the Barrandean area of the Czech Republic by Olda Fatka and others, the Early Ordovician conodont and graptolite biostratigraphy of Argentina by Guillermo Albanesi, the Late Ordovician corals of Mongolia by Ch, Minjin and J. Undarya, and the Ordovician biotas and biofacies patterns in Eastern Australia by Barry Webby and Ian Percival.

The fourteen-day field trip to southern and central Mongolia from 23 August to 5 September involved 37 participants from 9 different countries (Mongolia, China, Japan, Australia, France, Czech Republic, United States, Canada, Argentina). The most important Ordovician and mid-Palaeozoic successions with associated biotas were examined in a number of sections in the Gobi region of southern Mongolia (Mushgai and Shine Jinst areas), and in the Tsagaan del area, west of Bayankhongor (central Mongolia). Both IGCP 410 and 421 participants were able to study best sections and collect specific fossil biotas with the full scientific cooperation of our Mongolian hosts guided by our scientific leader Prof. Ch. Minjin, and chief organizer Dr B Tumenbayer. A comprehensive, well presented and illustrated 127-page guide book in English was provided for the field meeting, and it was supplemented by details on the local geology by our field guides each day of the tour (Prof. Ch Minjin, G. Sersmaa, Ya. Ariunchimeg, L Gereltsetseg, J. Undarya, Dr B. Tumenbayer, and M. Bolortsetseg). The highly successful program allowed us to complete all aspects of our planned scientific work in the localities at Mushgai, near Shine Jinst and at Tsagaan del, as well as to make short visits to two of the celebrated Cretaceous dinosaur sites in the Gobi desert. The most diverse and well preserved Ordovician biotas (brachiopods, corals, bryozoans, conodonts and a few stromatoporoids) were found in the Tsagaan del hill area of central Mongolia, though stratigraphically the succession is limited, mainly Ashgillian in age. In contrast, the Palaeozoic sequences in the Mushgai and Shine Jinst areas of the Gobi desert were more deformed and metamorphosed, with the Ordovician biotas (mainly corals) only locally diverse, in limestones of either late Caradocian or Ashgillian age. No graptolites, nor chitinozoans (A. Achab personnal communication) were found, though cleaved siltstones and slates are well represented in the Ordovician successions of the Gobi region (e.g., in the Daravgai Formation of the Shine Jinst area).

Our Mongolian colleagues did a tremendous job running this field trip, meeting all the logistic challenges, such as the sometimes difficult, "outback", road conditions of the Gobi desert, and the two days of inclement weather with heavy rain and gale-force winds when it became necessary to arrange overnight accommodation in small villages. On other nights we slept in tents, except in the Mushgai area where we were able to spend two nights in a Mongolian "ger". Transport was by a large Russian 4-wheel drive truck, an assortment of jeeps and 4-wheel drive minibuses. The camp sites were well organized, with good food and living arrangements. A highlight was a night in the Gobi desert when the cooks and drivers organized a Mongolian-style barbecue that featured goat meat supplied by local nomads cooked (pressure-cooker style) with vegetables between red-hot basalt stones in a 10-gallon milk drum - an exceptional meal of tender, deliciously flavoured meat. On our return to Ulaanbaatar we were also able to visit the Eredene Zuu monastery on the site of the ancient capital of Kharkhorin, and to attend a concert of traditional music that included a performance of Mongolian throat singing. In Ulaanbaatar we had opportunities again to meet geologists at the Mongolian Technical University, to visit the Natural History Museum, and were treated again to the very generous Mongolian hospitality.

2.3.c. Other Meetings - Copenhagen and Lille

IGCP 410 was also involved in the sponsorship of two other meetings in Europe during 2001. The first was a meeting of the Working Group on the Ordovician Geology of Baltoscandia (WOGOGOB), from 16-20 May, in Copenhagen (Denmark) with an accompanying field trip near Lund (Sweden). This meeting, organized by D.A.T Harper and S. Stouge, was attended by 45 delegates from 8 European countries, and included a session of talks on the theme: "Biodiversity changes in the Ordovician of Baltoscandia". Two postgraduate students from Estonia and Russia who contributed Ordovician papers to this session were supported by IGCP 410. A 47-page abstract volume edited by D.A.T. Harper and S. Stouge included papers on Ordovician biodiversity topics.

A second meeting, entitled "Early Palaeozoic Palaeogeographies and Biogeographies of Western Europe and North Africa" was held in Lille, France, from 24-26 September, and organized by J.J. Alvaro

and T. Servais, attended by 101 scientists from 16 countries. Two field excursions were organised, each with published guide books, the first to examine Lower Palaeozoic stratigraphy and sedimentology in Belgium (Brabant Massif & Condroz inlier), and the second, focusing on Early Palaeozoics of the southern Montagne Noire in France. Again relevant biodiversity sessions were included in the indoor program, with IGCP 410 supporting three established Ordovician scientists, from China, Russia and Italy, respectively.

2.4. Educational, training or capacity-building activities.

Project leaders of both IGCP 410 and 421 have helped considerably in the editing process of English versions of the Mongolian and Siberian guide books, as well as an English version of the Ordovician and Silurian correlation chart of Mongolia. The Mongolian volume (field guide, abstracts and correlation chart) is currently being further revised and will be re-published in an updated English version for wider circulation during 2002, as it is the only good introduction to the Palaeozoic geology of Mongolia presently available in English.

Of particular importance and relevance, also, was the level of successful interchange between the visiting scientists and the host scientists, that has led, since the field meetings, to invitations for two Mongolian post-graduate students to commence Ph.D studies in North American institutions in the near future.

2.5. Participation of scientists from developing countries

Again we have encouraged the participation of scientists from developing countries in IGCP 410 activities, and made a chief focus of our years' work visiting regions that need assistance, as well as outstanding younger scientists from countries like Argentina. Of the US $10,500 financial support provided this year, approximately 45% of the total was allocated to support scientists travel and accommodation costs from Mongolia (2), Russia (2), Estonia (1), and China (1), as well as for local transportation costs in support of the Mongolian and Siberian field trips. Two other Chinese Ordovician scientists were allocated grants to attend the Siberian field meeting but were unable to attend because of Russian visa problems. Three of the most-talented, younger scientists (all leading Ordovician specialists) from Argentina were also supported, with near 40% of the total, because the costs of travel from Argentina to attend meetings in California and Mongolia remains very expensive, and local Argentinian support for the younger scientists is almost non-existent.

2.6. List of most important publications (including maps)

Included in "Recent Ordovician Publications" pp. 65-79.

2.7. Activities involving other IGCP projects or the IUGS

As in previous years we continued to maintain close links with the IUGS Subcommission on Ordovician Stratigraphy, especially in relation to establishing our highly integrated global Ordovician time scale. We were also became involved in a closer relationship with IGCP 421 (N Gondwanan Mid Palaeozoic Biodynamics) this year, than previously, when we mounted the combined IGCP 410/421 field meetings, first to Siberia and immediately following, to Mongolia. Scientific colleagues of both IGCP projects had the choice of attending both meetings, or just one or the other, and to participate in field work that focused on both interest groups - some days with the group combined and working together in the field, and on other days with the group splitting into two, based on the special IGCP 410 (Ordovician) or IGCP 421 (Mid-Palaeozoic) interests. This proved a most successful arrangement for both IGCP parties.

3. Activities planned for 2002

3.1. General goals

The requested extension of one year (2002) will give us time to complete the remaining global and regional Ordovician diversity syntheses for publication, and allow the final meeting to be held in association with the first International Palaeontological Congress in Sydney, Australia, in July 2002.

3.2. Specific meetings and field trips

Two international meetings are proposed for 2002. The first will be in support of the "Early Life" symposium being held in association with the Geological Association of Canada's Annual Congress in Saskatoon, Saskatchewan (Canada) in late May 2002. The session will "explore the patterns and processes of biotic radiation, mass extinction, and post-extinction recovery, and their relationships to the evolving lithosphere, hydrosphere, and atmosphere during the Early Paleozoic Era". The organizers are Jisuo Jin (University of Western Ontario) [email: jjin@uwo.ca], P. Johnston (Royal Tyrrell Museum) and B. Pratt (University of Saskatchewan).

A second (and final) IGCP 410 meeting will be held in Sydney in conjunction with the First

International Palaeontological Congress (IPC) being organized by J.A. Talent, R. Mawson, G. Brock, from 6-10 July 2002. For congress details see web site: http://www.es.mq.edu.au/mucep/ipc2002/

The IGCP 410 session will highlight "likely impacts of Ordovician Earth Systems processes on the Great Ordovician Biodiversification Event." C.R. Barnes (University of Victoria, Canada), I.G. Percival (NSW Geological Survey - Australasian Regional Team Leader of IGCP 410; email: iperciva@laurel.ocs.mq.edu.au) and B.D. Webby will act as convenors of the session. A field trip to examine the Ordovician-Silurian graptolite succession in SE Australia is also scheduled by the IPC organizers.

4. Request for extension, on-extended-term-status, or intension to propose successor project

T. Servais (Lille, France) is now at preliminary stage of planning an application for a successor project that will explore how the changing patterns of Ordovician-Silurian geography may have influenced the major biotal changes, from Ordovician diversification to end-Ordovician extinction, and then diversification again during the Silurian. We understand a proposal is likely to be submitted to the IGCP Board in October 2002.

5. Other relevant information (Appendices 5.1-5.5)

5.1. Riverside clade meeting organized by Mary Droser, June 2001

The eighth international meeting of IGCP 410 was held in the University of California, Riverside, from 22-24 June. It was organized by Co-Project Leader M. Droser and her Riverside colleagues with a focus on global and regional patterns of Ordovician biodiversity and, in particular, presentations of work programs by our IGCP 410 clade teams. Over the three days of the meeting, 35 talks and posters were presented, covering a wide range of global and regional biodiversity topics including the following clade groups - acritarchs, brachiopods, bryozoans, chitinozoans, corals, echinderms, graptolites, machaeridians, radiolarians, stromatoporoids trace fossils, trilobites and vertebrates - as well as a contribution on a more fully integrated Ordovician time scale. Some 45 scientists from 13 different countries participated in this well organized, intensive and most productive meeting. A 14-page book of abstracts was published as a special issue of *PaleoBios* by the Museum of Paleontology, University of California, Berkeley.

Just before the meeting we were advised by the Science Editor of the Columbia University Press that our book plan for the publication of the clade team results had been accepted - a single volume to be entitled "The Great Ordovician Biodiversification Event", and to appear in the publishers "Perspectives in Paleobiology & Earth History Series". This volume will be edited by the three IGCP 410 Project Co-Leaders, B. Webby, M. Droser and F. Paris. Consequently, wide ranging discussions were held on topics such as: contents, authorship, timetable and deadlines, publishers guidelines, global time scale and diversity measures to be employed. The book will comprise: (1) an introductory section with brief outlines relating to Ordovician time and the Ordovician world (topics such as plate tectonics, paleoclimates, paleooceanography, sea levels, isotope signatures, volcanism, orogeny, a possible superplume, and end-Ordovician glaciation); (2) about 35 chapters documenting the diversity patterns of the clade groups (with more than 50 authors); and (3) a concluding part, with one or more, summary-type global biodiversity syntheses. We expect a published book of about 370 pages, with publication during 2003 (brief report contributed by B.D. Webby).

5.2. Combined IGCP 410/421 Mongolian meeting report prepared by B.D. Webby, October 2001

This joint IGCP 410/421 field meeting commenced with a one-day indoor meeting in Ulaanbaatar on 22 August in the Conference Hall of the Mongolian Technical University, where we were a warm welcomed by the University's President, Prof. D. Badarch. A session of ten talks and a poster were then presented by the delegates, that covered a wide range of topics relating to Ordovician biodiversity, North Gondwanan mid-Palaeozoic bioevents, biogeographic affinities, taxonomy (Asian charophytes) and Mongolian crustal (magmatic) events.

The fourteen-day field trip to southern and central Mongolia from 23 August to 5 September involved 37 participants from 9 different countries (Mongolia, China, Japan, Australia, France, Czech Republic, United States, Canada, Argentina). The most important Ordovician and mid-Palaeozoic successions with associated biotas were examined in a number of sections in the Gobi region of southern Mongolia (Mushgai and Shine Jinst areas), and in the Tsagaan del area, west of Bayankhongor (central Mongolia). Both IGCP 410 and 421 participants were able to study best sections and collect specific fossil biotas with the full scientific cooperation of our Mongolian hosts guided by our scientific leader Prof. Ch. Minjin, and chief organizer Dr B Tumenbayer. A comprehensive, well presented and illustrated 127-page guide book in English was provided for the field

meeting, and it was supplemented by details on the local geology by our field guides each day of the tour (Prof. Ch Minjin, G. Sersmaa, Ya. Ariunchimeg, L Gereltsetseg, J. Undarya, Dr B. Tumenbayer, and M. Bolortsetseg). The highly successful program allowed us to complete all aspects of our planned scientific work in the localities at Mushgai, near Shine Jinst and at Tsagaan del, as well as to make short visits to two of the celebrated Cretaceous dinosaur sites in the Gobi desert.

Our Mongolian colleagues did a tremendous job running this field trip, meeting all the logistic challenges, such as the sometimes difficult, "outback", road conditions of the Gobi desert, and the two days of inclement weather with heavy rain and gale-force winds when it became necessary to arrange overnight accommodation in small villages. On other nights we slept in tents, except in the Mushgai area where we were able to spend two nights in a Mongolian "ger". Transport was by a large Russian 4-wheel drive truck, an assortment of jeeps and 4-wheel drive minibuses. The camp sites were well organized, with good food and living arrangements. A highlight was a night in the Gobi desert when the cooks and drivers organized a Mongolian-style barbecue that featured goat meat supplied by local nomads cooked (pressure-cooker style) with vegetables between red-hot basalt stones in a 10-gallon milk drum - an exceptional meal of tender, deliciously flavoured meat. On our return to Ulaanbaatar we were also able to visit the Eredene Zuu monastery on the site of the ancient capital of Kharkhorin, and to attend a concert of traditional music that included a performance of Mongolian throat singing. In Ulaanbaatar we had opportunities again to meet geologists at the Mongolian Technical University, to visit the Natural History Museum, and were treated again to the very generous Mongolian hospitality.

Discussions at the University included a decision to revise and republish the field trip guide book because it provides such an excellent introduction to the Palaeozoic geology of Mongolia in English. This will be done with an up-dated version available for wider circulation during 2002. Another positive outcome of the meeting, resulting from the positive mutually cooperative links established during the field meeting, is the news that at least two Mongolian post-graduate students are likely to get opportunities to study for Ph.Ds in North American institutions in the next few years.

Several other Australians attended the Mongolian meeting, including L. Sherwin (NSW Geological Survey, Orange), P. Cockle & G. Felton (Macquarie University), and R. & J. Cantrill (University of Tasmania).

5.3. Report of the Lille meeting on Early Palaeozoic geography prepared by Florentin Paris

"Early Palaeozoic Palaeogeographies and Biogeographies of western Europe and North Africa" (University of Lille I, Villeneuve d'Ascq, September 24-26, 2001)

This scientific meeting was co-organised by José Javier ALVARO and Thomas SERVAIS from the Lille University (UPRESA 8014 of the French CNRS). It was held in the Conference Centre of Villeneuve d'Ascq, near the campus of Lille University. A total of 101 attending scientists from 16 different countries were registered. The symposium was sponsored by several regional organisations, but also by the French Palaeozoic Working group and by the Geological Society of France, the Geological Society of the North, and the Geological Society of Belgium. IGCP n° 410 was also among the sponsors and provided a financial support to 3 foreign scientists (1 Chinese, 1 Russian and 1 Italian) for attending the meeting and making a presentation of their scientific results on IGCP n° 410 s' topics.

An abstract volume grouped the 36 abstracts of the oral communications and the 36 posters abstracts as well as a list of the participants. The oral communications, most of high standard, have been presented during the 3 days indoor sessions. Each day session ended with a workshop, chaired by 2 experts (J.J. ALVARO and J.H. SHERGOLD for the Cambrian, F. PARIS and R.A. FORTEY for the Ordovician, L.R.M. COCKS and A LE HÉRISSÉ for the Silurian). These workshops were organised in order to clarify the terminology and to discuss the various models used for the palaeobiogeographic reconstructions of Europe and North Africa for Early Palaeozoic times. Thanks to T.. TORSVIK, the strong and the weak aspects of palaeomagnetic data were also discussed during these worksops.

On September 25th, during the indoor session with 61 attending scientists, F. PARIS on behalf of the 3 co-leaders of IGCP n°410, exposed the mains activities of the Europe Africa Regional Team of IGCP n° 410, and the progress registered more specifically on the biodiversification of the Ordovician clades. A peculiar attention was paid to the presentation of the project of a collective volume "Ordovician Biodynamics: Global Patterns of Rising Biodiversity" (B. WEBBY; M. DROSER & F. PARIS eds.) to be published by Columbia University Press A two-fold poster summarising the main activities of IGCP project n° 410 for 5 years was also presented during the poster session.

Two geological excursions were organised in connection with the Lille conference. The pre-conference excursion in Belgium (22-23 September,

2001) was guided by A. HERBOSCH, J. VERNIERS, T. DEBACKER, B., S. DE SCHEPPER et M. BELMANS. A very well documented guidebook (59 pages, 9 plates) on "The lower Palaeozoic stratigraphy and sedimentology of the Brabant Massif in the Dyle and Ormeau valleys and the Condroz inlier at Fosses: an excursion guidebook" was distributed to the participants.
The post-conference excursion (27 -30 September, 2001), leaded by D. VIZCAÏNO and .J. ALVARO, focused on the Early Palaeozoic of the Montagne Noire, in southern France. An issue of the Société géologique du Nord (t. 8, 2ème série, fasc. 4, p. 185-242) including 8 papers giving the up-dated information on the Cambrian and the Ordovician of this key area in France entitled "The Cambrian and Lower Ordovician of the southern Montagne Noire (Languedoc, France), a synthesis for the beginning of the New century" was distributed to all the participants to the Lille meeting.

5.4. Report of the Europe-Africa Regional Team (co-ordinator, F. Paris)

5.4. a) Report from British Isles (co-ordinator: Alan Owens)

The Regional Team Work in the British Isles remains focused on the database project at Glasgow University. The database is now effectively complete in terms of the trilobites, conodonts, pelmatozoans and bivalves and also includes less comprehensive data on other echinoderms and molluscs together with a wide range of other phyla. Presentation on the trilobites (with Dr Tim McCormick) and conodonts (by Dr Howard Armstrong) arising from the database work were given at conferences in Oxford and London respectively and will be published in 2002 in the resultant conference volumes. Further work is in progress on the conodonts and an overall analysis of Ordovician biodiversity change in the Anglo-Welsh sector of Avalonia is being undertaken. In addition, a PhD student at Glasgow, Sarah Stewart, has started a project on the poorly known and problematical elements of the Ordovician faunas in the Girvan district, SW Scotland. Her data is being incorporated in the database and should provide a fuller picture of the changing total biodiversity in the Midland Valley terrane.

I was also co-convenor, with Dr Alistair Crame of the **Lyell Meeting on 'Palaeobio-geography and Biodiversity Change'** in February 2001 at the Geological Society of London. Half of the programme was devoted to the Ordovician biodiversification and its palaeobiogeographical context and comprised presentations on brachiopods, bivalves, trilobites, conodonts and other vertebrates as well as the links between volcanic activity and biodiversity change All of these will be published in a *Special Publication of the Geological Society of London* which Alistair Crame and I are currently editing and will be published in late spring/early summer 2002.

Within the context of the work of the **clade teams**, workers in the British Isles are contributing to the chapters on at least seven of the groups in the forthcoming 'Ordovician Dynamics' volume. For my own part, I am coordinating the compilation of the trilobite chapter which will include contributions from Jonathan Adrain, Greg Edgecombe, Richard Fortey, John Laurie, Tim McCormick, Beatriz Waisfeld, Barry Webby and Steve Westrop.

5.4. b) Report from France (co-ordinator Florentin Paris)

Part of the activity of the French group was concentrated on sedimentological aspects of the Ordovician succession in the Armorican Massif (M.P. Dabard, A. Loi; F. Guillocheau and M. Malascrabes).

One of the main goals was to document a regional sea-level curve for the Ordovician succession in northern Gondwana regions and to draw "time lines" based on outstanding sedimentological features e.g. MFS, calibrated with regard to the chitinozoan biozones.

The record of fauna for the palaeontological database from areas located at high latitude during the main part of the Ordovician was maintained. A 4-week field trip was organised by the SONATRACH (National Algerian Oil Company) in the Tassili area (SE Algerian Sahara) with special interest to the Early Ordovician clastic succession close to the African craton and to the Ordovician/Silurian boundary beds. Trace fossils, inarticulated brachiopods, graptolites and chitinozoans have been recorded (K. Boumendjel, P. Legrand, F. Paris). For the western part of North Africa, Jacques Destombes has gathered in an unpublished booklet all the identified fauna he collected during a full life of field work on the Ordovician of Morocco.

Several colleagues (Ahmed Bourahrouh, who is finishing his doctoral thesis on the impact of the late Ordovician glaciation on the palynomorphs from northern Gondwana regions) attended to the International Congress "The Gondwanan platform during Ordovician times: Climatic eustatic and geodynamic evolution", organised by Professor Naïma Hamoumi from January 30- February 6, 2001 (Rabat, Morocco). Others participated at the meeting of the IGCP 410 organised by Mary DROSER on June 22-24, 2001 in Riverside, California, USA, (see specific report above).

French specialists (Alain Blieck, for the vertebrates, Taniel Danelian for the radiolarians, Hubert Lardeux for the tentaculites, Florentin Paris for the chitinozoans, Patrick Racheboeuf for the phyllocarids, Thomas Servais and Alain Le Hérissé for the acritarchs) are involved in the writing of several chapters for the volume to be published by the Columbia University Press (see Clade book)

5.4. c) Iberian Peninsula (co-ordinator: Juan Carlos Gutiérrez Marco)

The activity of the Spanish group (individual initiatives, national or international programs) was concentrated in 2001 on the study of Cambro-Ordovician fossils from various European (Spain, Portugal, France, Bulgaria, Turkey), African (Morocco) and South American (Argentina, Peru) countries.

In Spain, the main activity focused on the detailed biostratigraphic investigations of the Ordovician succession in a road tunnel in the Cantabrian Mountains. 250 fossiliferous horizons from shales of late Darriwilian age and from the Barrios Formation yielded numerous new fossils. The Barrios Formation revealed to be much more fossiliferous than believed previously (graptolites, brachiopods, arthropods). It includes a volcanic layer with zircons allowing radiometric dating.

An updated synthesis on the Ordovician System of Spain (including new palaeontological and biostratigraphic results) will be published in a volume of the Geological Society of London. Additional palaeontological investigations are concerned with the echinoderms of the Middle and Upper Ordovician of the Central Iberian region and new palaeogeographic reconstruction for late Ordovician time i.e. including the glaciation event in northern Gondwana regions. A new project "Bioestratigrafía y correlación del Paleozoico Inferior de la Rama Castellana de la Cordillera Ibérica" of the Spanish Minister of Sciences and Technologies has been accepted. It will be led by J.C. Gutiérrez-Marco (Madrid). Three doctoral thesis dealing with "Biostratigraphy of the Ordovician of NE Portugal" (A. A. SA), "Conularids (Scyphozoa) of the Ordovician of Spain" (M.C. SENDINO LARA) and "Ordovician conodonts from the Iberian Cordillera and the Sierra Morena " (B. del MORAL HERNANDEZ) were initiated in 2001 in Iberian regions. Among the various new results obtained by members of the Spanish group are: - the first report of conodonts (*Oepikodus evae* and boundary *Baltoniodus navis/B. triangularis* biozones) in Peru, - the study of the lower Tremadocian graptolites, with new species from the Famatina terrane (Argentina), - the discovery of reworked Ordovician conodonts in the Silurian of the Precordillera (Argentina) and in the Coastal Meseta (Morocco), - the study of microbrachiopods from the Late Cambrian of southern France, and the revision of the Ordovician macrofaunas including trilobites from Bulgaria.

Meetings attended by members of the Spanish group of IGCP 410:

- The third national meeting of the Spanish working group for the IGCP Project 410 was celebrated in Albarracín (Province of Teruel, Aragón) on October 19 , 2001, as a special symposium included in the schedule of the XVII annual meeting of the Spanish Palaeontological Society. The business meeting was followed by four oral presentations.
- Official Business Meeting and Field Excursion of the Subcommission on Ordovician Stratigraphy/ IUGS. Rabat (Morocco), 30 January-7 February 2001.
- Early Palaeozoic palaeogeographies and biogeographies of Western Europe and North Africa (joint meeting IGCP projects 410 & 421). Lille (France), 24-26 September 2001.

- IV Reunión Argentina de Icnología y II Reunión de Icnología del Mercosur. Tucumán (Argentina), 24-28 September 2001.
- XVII Jornadas de la Sociedad Española de Paleontología. Albarracín (Teruel), 18-20 October 2001.
- VII Jornadas Aragonesas de Paleontología (La Era Paleozoica. El desarrollo de la vida marina). Ricla (Zaragoza), 8-11 November 2001.

5.4. d) Italian group Co-ordinator: A. LOI (University of Cagliari)

Members: F. LEONE, G.L. PILLOLA, P. PITTAU (University of Cagliari), E. SERPAGLI, A. FERRETTI (University of Modena), M. TONGIORGI, G. BAGNOLI, R. ALBANI, M. VECOLI (University of Pisa)

The genesis of siliceous nodules is demonstrated to be intimately related to Milankovitch cycles. Such nodules are recorded on the Upper Ordovician distal platform of the Armorican massif. They document high to very high frequency cycles of these deposits. A joint study of the sedimentology and fauna of different phosphatic beds is carried on in order to establish the typology of phosphate accumulations. The phosphatogenesis seems restricted to the upper offshore and the diversity of the facies is controlled by the bathymetry. The genesis of phosphatic beds is related to condensation processes. Such beds can be therefore regarded as time-significant surfaces allowing 2D and 3D reconstruction of the Armorican basin for Lower Ordovician times.

New investigations have been carried out on the Armorican Sandstone Formation in order to document facies models, lateral facies variation and 3D basin reconstruction.

Facies analysis, eustatic control and geochemistry of the Mn glacial deposits have been made in the Upper Ordovician sequences of Sardinia.

Contribution of the Modena group.

A Late Ordovician conodont association from the central part of Carnic Alps has been studied recently. The fauna recorded in the Uggwa Limestone and in the Wolaya Limestone belongs to the *Amorphognathus ordovicicus* Zone. In the Cellon section, a rich conodont association, clearly with an Ordovician aspect, occurs immediately above a *Hirnantia* brachiopod fauna. *A.* cf. *A. ordovicicus* and *A. lindstroemi* are present. "*Dichodella-Birksfeldia*" elements, corresponding probably to the North American "*Gamachignathus*", i.e. a genus typical of the Gamachian, are well represented. They coexist with cold water forms such as *Sagittodontina* and *Istorinus*.. This poorly diverse association allows the definition of the first Hirnantian conodont fauna from the Atlantic Province.

The study of the Ordovician cephalopods of Sardinia is difficult, due to the poor preservation or the material. A first result is the identification of *Cameroceras* cf. *vertebrale* (Eichwald, 1860), not only in Sardinia but also in all the Mediterranean area Concerning the Ordovician algae, *Cyclocrinites* (Dasycladales) and *Ischadites* (Receptaculitales) are reported for the first time from the siliciclastic sequence of the Portixeddu Formation (upper Caradoc - lower Ashgill) of Sardinia. They are represented by *Cyclocrinites* aff. *vanhoeffeni* in the lower part of the formation, and by *Cyclocrinites* sp., *Ischadites* sp.a and *Ischadites* sp.b in its upper part. The taxonomic affinities of the two genera are deduced from their growing pattern. From the ecological point of view, these algae seem to be have a bathymetric range restricted between 20 and 60 m. Important palaeogeographic results are obtained too: *Cyclocrinites* and *Ischadites* are usually reported from warm circumequatorial water. Therefore, warm currents reached the northern Gondwana margin during the upper Caradoc-lower Ashgill and Sardinia was probably located in a more marginal position than previously thought.

5.5. Individual reports

5.5. 1: Argentina

Guillermo ALBANESI continues working on diverse aspects of conodont faunas from Ordovician basins of western and northwestern Argentina, and other major projects with Argentine and foreign colleagues. Together with Gladys Ortega, we are working on conodont-graptolite biostratigraphic ties to develope a comprehensive biozonal scheme for the Ordovician System of Argentina; with particular interest on the correlation of inter-series and inter-stage global boundaries. Currently, I'm working with Stig Bergstrom in The Ohio State University, as a Fulbright scholar, on a project entitled: Conodont Paleobiogeographical Co-evolution of the Argentine Precordillera and the Marathon Area of Texas in the Ordovician Period. In cooperation with Argentine Ordovician workers, we are involved in the organization of next ISOS, to be held in San Juan, Argentina, August 2003 (http://www.cricyt.edu.ar/2003.htm).

Matilde BERESI: I am actively working on the biostratigraphy, sedimentology and paleoenvironment of the Ordovician sequences of Mendoza Precordillera, west Argentina with my colleague Susana Heredia (conodonts), Universidad del Comahue. The work is focused on the siliciclastic sequences with Cambrian and Ordovician carbonate olistolites and also on the Ordovician sequence of Ponón Trehué, south of Mendoza province. Susana is working on the conodont faunas and I have worked on the sponge spicules of autochthonous and allochthonous Ordovician sediments. I am involved in ongoing collaborations with colleagues from the Universidad Nacional de San Juan.San Juan University on the Upper Arenig to Lower Llanvirn carbonate platform sequences of the eastern and central Precordillera of San Juan Province. The project in progress includes biostratigraphy, sedimentology, conodont and nautiloid (M. Beresi) fauna, from the Ordovician sequences of the Villicum and La Trampa Ranges. I am working on Ordovician nautiloid associations from the Precordillera with Dr. Bob Frey.I have completed the nautiloid data base from South America for the IGCP project 410 (GOBE).

Edsel BRUSSA: I continue working with Ordovician graptolites from the Precordillera and Northwestern Argentina. In the Precordillera the work is focused, principally, in the Yaapenian and Darriwilian faunas, although we are also analyzing. Ashgillian associations from the western tectofacies. In Northwestern Argentina the work is concentrated in the western border of the Eastern Cordillera and in the Puna region. Actually I am studying new graptolites assemblages from volcanic-sedimentary rocks in the Huancar area. A reexamination of the Rusconi and Loss collections from the museums of Mendoza and Jujuy, respectively, is going on. I am

recently involved in the study of Ordovician phyllocarids from Argentina.

5.5.2. Australia

Ian PERCIVAL has devoted considerable time during the past year to producing several papers which appeared recently in Alcheringa 25(1-2), honouring the research achievements of Barry Webby. He was also involved in assisting the editing of this journal. Other research related to IGCP 410 has concentrated on documentation of Early Ordovician conodonts from central and far western New South Wales, in collaboration with Yong-yi Zhen (Australian Museum) and Barry Webby (Macquarie University). Ian's work at the Geological Survey of NSW continues to primarily focus on latest Darriwilian conodont faunas preserved in deepwater cherts of the Lachlan Fold Belt.

5.5.3. Canada

Chris BARNES and Leanne PYLE have been completing two major Ordovician platform to basin transects through the northern Canadian Cordillera, using conodonts. Taxonomic and paleoecologic studies have been completed and further work on the pattern of biodiversity is in progress and should be completed in 2002. Similar work continues in the Ordovician sequence in Western Newfoundland and the Anticosti Basin.

Godfrey NOWLAN: My current work includes recent completion of work in defining the Cambro-Ordovician boundary globally; study of the conodonts from the Cambro-Ordovician Deadwood Formation in the sub surface of Saskatchewan and North Dakota; conodont biostratigraphy and biofacies related to neodymium and carbon isotopic signatures as they might track sea level on the North American continent (with C. Holmden and F. Haidl); conodont evolution in the Cambrian to Silurian strata of northeastern Ellesmere Island (with O.Lehnert and others).

Graham SHIELD: I am working on a compilation of Sr, C and O isotope data through Earth history, including the Ordovician Period.

5.5.4. Estonia

Linda HINTS wrote: I am a leader of the project "The Baltic faunal province and developmentof its biota in the Ordovician" (2001-2003, financed by the Estonian Science Foundation). The main goals of my own study on the articulated brachiopods are 1) to characterize the brachiopod successions in the light of facies differentiation in the East Baltic, 2) to study the brachiopod faunas from the easternmost parts of the Baltic Basin (Moscow Basin) using materials from the collections housed at the institute, 3) to clarify the dynamics of the Baltic Ordovician brachiopod faunas. The general overviews on the brachiopod faunas in the East Baltic (Harper & Hints, 2001, Hints & Harper in press), the special problems on brachiopods in restricted stratigraphical intervals (Hints, et al., 2000; Zuykov & Hints, in press) and joint studies on the distribution of brachiopods and isotopic composition during the periods of essential changes of environments in the basin (Kaljo et al.,2001; Marshall et al., in press) contribute to the understanding of the Ordovician biodiversification event.

5.5.5. New Zeland

Roger COOPER wrote: I am working jointly with Peter Sadler on refining the calibration of the Ordovician and Silurian time scales, using Constrained optimisation to incorporate all the data from over 200 stratigraphic sections, containing 1200graptolite species, plus the 22 most reliable radio-isotopic zircon dates. The new time scale is used to measure precise rates of graptolite macro-evolution, including speciation and extinction rates, and faunal turnover. Three regions are compared and contrasted - Australasia, Baltica and Avalonia - representingthe low, intermediate and high paleolatitudes respectively. The results will be included in the Columbia University Press book, as a contribution from the graptolite clade working group (Cooper, Maletz, Zalasiewicz, and Taylor).
The Cambrian-Ordovician boundary was formally defined in the Green Point section, at the first appearance of the conodont, *Iapetognathus fluctivagus,* by SOS in 2000.

5.5.6. Poland

Ryszard WRONA wrote: Next years research related to IGCP 410 will involve studies of the biostratigraphic and palaeobiogeographic utility of the early Palaeozoic Chitinozoa from the Holy Mountains (southern Poland) for the understanding of the amalgamation history of the TESZ in S Poland.

5.5.7. Russia

Andrei DRONOV wrote: We continue our study of depositional environments, facies and sea-level changes in the Ordovician of Baltoscandia. Current projects are as follows: 1) Study of high-frequency and low-magnitude eustatic sea-level fluctuations during the "Volkhovian" interval (together with Arne Nielsen and David Harper from Copenhagen, Denmark). We have already spent two field seasons in Putilovo quarry and on Lynna River section (St.Petersburg Region) investigating in detail BII-beta

and BII-gamma intervals. Next year we will continue with BII-alpha in Putilovo; 2) Detailed study of the Ordovician section in Mishina Gora impact structure (together with paleontologists from Moscow Sergei Rozhnov and Veronica Kushlina). This section is expected to be a missing link between typical Scandinavian and typical East Baltic facies. It will help to establish a high-resolution stratigraphic correlation between Central Baltoscandian and North Estonian Confacies belts of V.Jaanusson; 3) Together with Lars Holmer and Ulf Sturesson from Uppsala University we continue our study of the Kunda depositional sequence and Ordovician sea-level changes in general; 4) Peter Fedorov continue his study of the "Hecker-type mud mounds" - cool water microbial "reefs" of the Billingen and Volkhov regional stages of Baltoscandia; 5) in our plans are also comparative study of the Baltoscandian and Timan-Pechora ordovician basins (together with Valentina Zhemchugova and Sregei Melnikov) as well as a study of the Volkhovian trace fossils in St.Petersburg Region together with Radek Mikulash from Prague and Gabriela Mangano from Argentina.

Michael ZUYKOV: This year I have participated in two short-term visitor programs. In April - Museum and Gallery of Wales, Geological department. My scientific advisors were Michael G. Bassett and Leonid E. Popov. The goal of this trip was to prepare one article with revision of Ordovician Brachiopod from Early Caradoc of East Baltic. This article including description of 27 taxa will be sent to edition during 2002. In July I participated in program of Smithsonian Institution, Washington DC. My scientific advisor was Robert Neuman. The aim of this trip was the study of Laurentian brachiopod genus *Platystrophia*. Preliminary results, which were obtained during this visit, will be discussed at the Annual Meeting of PalAss in Copenhagen, Dec.2001.

Svetlana V. DUBININA (Geological Institute, Russian Academy of Sciences, Pyzhevsky per. 7, 109017, Moscow; e-mail: dubinina@geo.tv-sign.ru) wrote that her research continues on Ordovician as well as Silurian-Late Devonian conodonts of chert/basalt and chert/tuffaceous assemblages of the Southern Urals. Biofacial, paleogeographical and paleobiogeographical aspects of her investigations also continue as well.

5.5.8. South Korea

Duck Keun CHOI: Investigation on the Cambro-Ordovician section in the southeastern part of the Taebaeksan Basin is still in progress. Emphasis has been given to the trilobite fauna of the Cambrian-Ordovician boundary interval and we have collected a fair amount of trilobite specimens across the putative Cambrian-Ordovician boundary interval. Aside from the trilobites, some well-preserved stylophorans are found in the interval examined. In addition, we (with S.K. Chough and D.J. Lee) have located several horizons of sponge bioherms from the Makkol Formation (Arenig-equivalent). This is the first record of Ordovician organic buildups in southern Korea.

5.5.9. United Kingdom

Leonid POPOV: As for my current activities, now I am working on various aspects (taxonomy,biofacies and biogeographic significance) of the Mid and Late brachiopod faunas from Kazakhstan mostly in co-operation with Igor Nikitin and Olga Nikitina from Almaty. I also continue to work on the Ordovician biostratigraphy and brachiopods of Iran together with Michael G. Bassett and Mohammed Dastanpoor. In the east Baltic I am currently working on revision of some selected taxa Early to Mid Ordovician rhynchonelliformean brachiopods in co-operation with some Russian, Estonian and Scandinavian colleagues. Another my interest is biostratigraphy, depositional environments and faunas of radiolarian cherts in Kazakhstan. This year I collected a reasonable number of radiolarian samples from two succeeding sections in West Balkhash region which cover the interval from the Late Cambrian Eoconodontus notchpeakensis Biozone to the Upper Llanvirn *Pygodus serra* Biozone. There is a good conodont control for these sections, which allowed to establish more precise radiolarian biostratigraphy. Now these samples under the study by Taniel Danelian. We also submitted a paper on a small radiolarian fauna from the lower Arenig deep water carbonates of south Kazakhstan. Radiolarian cherts also contain organophosphatic brachiopods, which represent possibly the earliest evidence of abyssal benthos in Palaeozoic. With Malgorzata Moczydlowska-Vidal we are working on the Cambrian - Ordovician transitional section recovered from the deep core in Kolguev Island, White Sea, North Russia.

John COPE continues investigations of Ordovician bivalves and early bivalve phylogeny and has much material awaiting description, including material from Australia collected with Barry Webby. It now appears that bivalve faunas are good indicators of palaeolatitude in the Ordovician. Fang Zong-jie (Nanjing) recently spent three months in Cardiff working with him on a Late Arenig bivalve fauna from West Yunnan and a manuscript describing the diverse fauna is essentially completed for publication.

Pat BRENCHLEY reported that a further submitted paper is an indication of the likely direction of his further work, using stable isotope stratigraphy as a Chemostratigraphic /chronostratigraphic scale against which level of environmental and biotic events can be placed. The submitted paper is: Brenchley, P.J., Carden, G.A., Hints, L., Kaljo, D., Marshall, J.D., Martma,T. and Nolvak, J. High resolution stratigraphy of Late Ordovician sequences in the Baltic region: constraints on the timing of bio-events and environmental changes associated with mass extinction and glaciation, and submitted to the Geological Society of America Bulletin.

5.5.10. United States

David ROHR: I am continuing to work with Lower Ordovician gastropods worldwide, but particularly from Newfoundland and Colorado. The goals are to refine the taxonomy and stratigraphic ranges of these taxa, many of which are poorly known or are from older publications using obsolete nomenclature. This time interval includes the first major radiation of the Gastropoda.

SCIENTIFIC REPORTS

MODZALEVSKAYA, TATIALANA L.
All-Russian Geological Research Institute (VSEGEI), St.Petersburg, Russia

The research on correlation of the Silurian sequence of Timan-Northern Ural Region with Baltic sections and with the International Standard (Antoshkina et al., 2000) defines more precisely the position of Ordovician-Silurian boundary in the Urals on brachiopods and conodonts.

The abrupt replacement of the middle Ashgillian brachiopod fauna with Holorhynchus giganteus (Yaptikshor Regional Stage) by the Rhuddanian-Aeronian brachiopod fauna with Virgiana barrandei (Yareney Regional Stage) take place within the lithologically quite homogenous secondary dolostone succession. In the majority of studied sections between the strata with Ordivician fauna below and Silurian fauna above lies interval without any identifiable fossils. This interval much more likely corresponds to Hirnantian so as the youngest Ordovician fauna, characterised by *Holorhynchus gifanteus* in this region, is known to have become extinct before Hirnantian time (Brenchley et al., 1997).

Based on the latest ones and conodont data, the Ordovician-Silurian boundary (=the boundary between the Yaptikshor and Yarenej Regional Stages) in the north of the Urals lies in an interval coinciding with a regional regressive event (Antoshkina, 1996).

WANG, XIAOFENG
Yichang Institute of Geology and Mineral Resources, China

The Huanghuachang section, 20km from Yichang is well-exposed with plenty of conodonts, brachiopods, trilobites, chitinozoans and some graptolites-bearing interbeds from deflexus/ protobifidus Zone to Exigraptus Zone. A complete conodont sequence from communis Zone to originalis Zone can be recognized. Their relationship with other fossils is shown in Fig. 1.

	conodont	**grapt.**	**chitinozoa**	**trilobite**	**cephal.**	**brachio.**
Darriwan-ian	*parva*	*sinoden-tatus*	*pirum*	*Hanchogo-litus*		
	originalis navis trianglaris		*brevis*		*Protocyclo.*	*Uuorthisia*
					Bathmo.	*Leptella*
Doubao-wanian	*evae*	*suecicus*		*Pseudocaly-mene*		
	communis	*deflexus*	*baculata*			
Xinchang-ian	*diversus/ proteus*		*symmetrica*		*Manchuroces-Koreanoceras*	*Nanorthis-Eupuctata*

Fig. 1. Showing the relation of conodont Zone with other fossils zone between the Late Tremadocian to "Arenigian" at Huanghuachang section. Modified from Wang et al. 1987, 1994, 1992, 1996; Chen et al. 1996.

HONORARY NOTES

AWARDS

RICHARD FORTEY was awarded the Frink Medal of the Zoological Society of London (apparently their senior award) in June 1991. His book Trilobite: eyewitness to evolution was shortlisted for the Samuel Johnson Prize, a literary award worth £30000. (A book about Hitler won, which shows poor taste in his view!)

IN MEMORIAM

MICHAEL K. APOLLONOV
1935-2001

With a deep regret we would like to report that Dr. Michael K. Apollonov, senior research fellow of the Institute of Geological Sciences, Almaty past away on August 6th, 2001 at the age of 65.
Michael Apollonov was born on June 17, 1935, in Almaty and he attended the Faculty of Geology and Geography at Kazakh State University, where he completed the undergraduate education and obtained his MA degree in geology and oil exploration. Since 1958 and rest of his life he was a research fellow of the Institute of Geological Sciences, Almaty where he earned his Ph.D. in palaeontology in 1968 and D.Sci. degree in 1992. Interest in study of Early Palaeozoic geology and trilobites developed early in his academic career, when he joined a research team led by R.A. Borukaev famous of pioneering studies in Palaeozoic Kazakhstanian geology. In the following years Michael Apollonov became well established and respected palaeontologist who made valuable contributions in understanding of the Ordovician trilobite biostratigraphy, biofacies and regional geology of Kazakhstan. His detailed and comprehensive works on the Cambrian-Ordovician boundary sections in Malyi Karatau and on the Ordovician-Silurian sections in Chu-Ili Range are of particular interest because they made a great impact on further geological and palaeonotological studies of that kind in Kazakhstan and in Russia. During last decade of his life Michael Apollonov paid growing attention to the tectonic development of Kazakhstan orogen during the Palaeozoic. His unique knowledge of Kazakhstanian geology and faunas allowed to develop new ideas and new approaches to the tectonic raying and accretion history of Kazakhstan and Central Asia during the early Palaeozoic which are only partly published, but essential for further development of research in this direction.

Apollonov's publication record includes over 150 papers on wide ranging set of topics in palaeontology, stratigraphy and Palaeozoic tectonic history of Kazakhstan. He was a titular member of the International Ordovician Subcommission and Cambrian-Ordovician Boundary Working Group of IUGS, a member of Kazakh Interdepartmental Stratigraphic Committee and a member of editorial board of the journal "Geology of Kazakhstan".
In spite of a heavy illness, which he suffered a number of yours, Michael Apollonov remained optimistic and productive until the last days of his life. We remember him not only as a distinguished Kazakhstanian geologist and palaeontologist, but also as a good friend, nice and highly intelligent person we missed in our job and in our life.

IGOR F. NILITIN, OLGA I. NIKITINA, LEONID E. POPOV

MISCELLANEA

COMMENTS

The Government of Newfoundland and Labrador has revised the Historic Resources Act of 1985 to include protection for fossils, which previously was lacking.
BILL 57: AN ACT TO AMEND THE HISTORIC RESOURCES ACT (Government of Newfoundland and Labrador). http://www.gov.nf.ca/hoa/bills/ Bill0157.htm

W. DOUGLAS BOYCE

If you have time, please look up our Sino-German Cooperation Project Website: http://userpage.fu-berlin.de/~science/index.htm.

BERNIE ERDTMANN

Research Request: I am currently working on some organophosphatic brachiopods, and with special interest to genus *Paterula*. Can anyone offer me free valves of this genus or rock with them for etching of anywhere and any time (also Silurian, early Devonian)? I will be grateful for such contact.

MICHAL MERGL

There are photographs from three meetings available in web-site: http:/www.gi.ee/~helje
Third International Conference on Trilobites and their Relatives, Oxford, UK, 2-6 April 2001; WOGOGOB - 2001, Copenhagen, Denmark, 16-20 May 2001; 45th Annual Meeting of the Palaeontological Association, Copenhagen, Denmark, 15-19 December 2001.

HELJE PÄRNASTE

The Geological Survey of Denmark and Greenland will move to the newly established Geocenter, which consists of the Geological and Geographical institutes of the University of Copenhagen and the Geological Survey of Denmark and Greenland. The actual move is planned to occur sometime in May 2002.

SVEND STOUGE

Research Request: If anyone has information on reports of Scaphopoda in the Ordovician or presumed specimens that they would like to have looked at pleasel let me know. I am aware of Polylopia from Tennessee (disposed of years ago) reports from the Baltic by Eichwald (being disposed of by Kisselev) and material from Graff Iowa and Tennessee. It is too soon to be 100% certain, but scaphopods may not exist - or at least, to be cautious, may not be correctly identified so far - in the Ordovician. This is a long neglected group of Mollusca, but considering the quality of the material one has to examine, the deserve to be neglected! Still it is useful to know the oldest authentic occurrence in the fossil record, and I am sure it is much later than Ordovician.

ELLIS YOCHELSON

CURRENT RESEARCH

ACEÑOLAZA, FLORENCIO G. (Argentina). Lately, I have been working on trace fossils of the Stara Planina, Bulgaria (with S. Yanev) and several paleontological aspects of the Ordovician of NW Argentina., as well as actively participating in the discussions on the origin of the Precordillera of the western margin of Argentina. In this moment I am also (with several colleagues of Argentina) vinculated to the organization of the ISOS 2003, as well as to the edition of a up to date book on the argentine Ordovician.

ACEÑOLAZA, GUILLERMO F. (Argentina). I continue working on the biostratigraphy of the Cambro – Ordovician successions in NW Argentina, focusing mainly in trace fossils and some forgotten groups as few newly discovered soft body faunas. Together with Franco Tortello and Susana Esteban we are also pointing to little known areas (highly interesting) in the Eastern Cordillera of northern Argentina. I am also involved in the organization of the ISOS to be held in Argentina next year.

AINSAAR, LEHO (Estonia). I'm continuing to work on sedimentology and stable isotope geology of Middle and Upper Ordovician carbonates in Baltoscandia (with Tõnu Meidla, Andrei Dronov, Lars Holmer, Tõnu Martma and Oive Tinn). Together with Mark T. Harris, Peter M. 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. In September 2001 I defended PhD thesis at Tartu University.

ALBANESI, GUILLERMO L. (Argentina). In 2001 I had a special opportunity to participate in the field trip to the Gobi desert in Mongolia, organized by the leaders of IGCP projects 410 and 421, and localy leaded by Prof. Minjin and its Monoglian team. A memorable experience through the vast geology of Mongolia.
I have recently completed a Fulbright project, entitled: "Conodont Paleobiogeographical Co-evolution of the Argentine Precordillera and the Marathon Area of Texas", in colaborative work with Stig M. Bergström, at The Ohio State University in Columbus, USA. I am currently working on diverse aspects of conodont faunas from Ordovician and Silurian sequences of west and northwest Argentina, and other major projects with Argentine and foreign colleagues, e.g., new proposals on GSSPs. Gladys Ortega and I continue working on conodont-graptolite biostratigraphic ties to develope a comprehensive biozonal scheme for the Ordovician System of Argentina, with particular interest on the

correlation of inter-series and inter-stage global boundaries.
In cooperation with Argentine workers of the Lower Paleozoic, we are involved in the organization of the 9 ISOS, 7 IGC and SSS field meeting, to be held in San Juan City, Argentina, August 2003 (http:// www. cricyt.edu.ar/2003.htm).

ALDRIDGE, RICHARD J. (United Kingdom). Work continues on the Upper Ordovician Soom Shale lagerstätte of South Africa, now funded by the National Geographic Society. Last year Hannes Theron, Sarah Gabbott and I supervised new excavations at the principal Soom Shale locality at Kuerbos and we hope that our return in 2002 will provide rich pickings. Collecting undertaken in 2001 produced the first non-*Prommissum* conodont apparatus (Icriodella or a related genus) and some new enigmatic soft-bodied material.

ASTINI, RICARDO A. (Argentina). My main interests are into sedimentary geology of the Argentine basins and their evolution. I am currently working in several projects dealing with comparisons of the sedimentological patterns and stratigraphic evolution of the Subandean, Cordillera Oriental and Puna basins in the northwest. My major objective is the paleogeographic reconstruction of the Gondwana margin basins. As a hobby, I have been doing progress in detail studies of algae and I am currently revising the occurrence of Solenoporaceans in the Argentine Precordillera. I go on working in Famatina and in Precordillera where I have various students working at different sections. In Famatina I am doing important progress in the evolution of the volcanic arc and refining the depositional setting and relationships with the Precordillera Terrane. At present I collaborate in lithostratigraphy and sedimentology with Chuck Mitchell and Edsel Brussa in the Precordillera, with Beatriz Waisfeld, Blanca Toro and Claudia Rubinstein in the northwestern basins and with Guillermo Albanesi and Luis Benedetto in various different Ordovician sections. I also collaborate with Gabriela Mángano and Luis Buatois in refining trace fossil models. I go on working with Bill Thomas in the evolution of the Precordillera after its docking with Gondwana as well as with Sarah Roeske, Pete Cawood, Bob Tucker and Carlos Rapela in various dating projects. I also go on collaborating the K-bentonite group leaded by Warren Huff and Stig Bergström.

BAGNOLI, GABRIELLA (Italy). I´m actively working on Ordovician conodonts, chitinozoans and acritarchs from Oeland, Spain and Newfoundland.

BARNES, CHRISTOPHER R. (Canada). I continue to complete recent field-based Lower Paleozoic conodont studies in the Canadian Cordillera. Detailed platform to basin transects have been sampled in the southern, central and northern Rocky Mountains (with Leanne Pyle as current PDF). Several papers and a major monograph have appeared recently, are in press or are 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. Papers in press deal with conodont paleoecology and the response of the conodont communities to eustatic change; another paper is nearing completion on cladisitic analyses. Jianhua Zhang completed a PDF with a paper now in press on the Ordovician conodonts from the Stokes Siltstone, Amadeus Basin, Australia. Work completed, nearing completion or in process includes: Ashgill conodonts (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.

BATCHELOR, RICHARD A. (United Kingdom). A recently-awarded Leverhulme Research Fellowship has allowed me to accumulate geochemical data from apatite phenocrysts in Caradocian metabentonites from Scandinavia. The aim of this work is to refine local correlations and offer tighter fingerprinting for correlation further afield.

BEDNARCZYK, WIESLAW STANISLAW (Poland). I'm actively working on the Ordovician stratigraphy (litho- and biostratigraphy) of Poland (especially of northen Poland and Holy Cross Mountains) on the basis of microfossils (conodonts, chitinozoa, microscopical Lingulata).

BERESI, MATILDE SYLVIA (Argentina). I am working chiefly on biostratigraphy of Ordovician from the Province of Mendoza in cooperation with Susana Heredia (conodonts), with attention to sponge spicule assemblages from the Middle Ordovician of Ponón Trehue, Southern Mendoza. For a significant part of the past year, I am compiled the formations and biozones from the Ordovician of Mendoza province for the "Lexico Estratigráfico Ordovícico" (with S. Heredia). In addition, and as part of the IGCP 410 project, I have compiled all available data of Nautiloid faunas from South America for the Nautiloid Clade Group. Two papers are in final stages of preparation: a) the Ordovician sequences from the Precordillera of

Mendoza; b) microfacies and conodont faunas from the Ordovician carbonate rocks from the Ponón Trehue section (both with S. Heredia) and c) Ordovician gastropods from Argentina (Rohr, D.M., Beresi, M.S. and Yochelson, E.); it has been submitted for publication to the editor Jiri Fryda of the Havlicek volume, Journal of the Czech Geological Society.

BERGSTRÖM, STIG M. (USA). The year of 2001 was not memorable because illness (osteoarthritis) seriously affected my activities. A high point was a trip to China in the late summer where I had the opportunity to see the geology in the Beijing region (with Dong Xiping as splendid guide) and participate in a most memorable Cambrian field meeting in south China, where I got a chance to study Cambrian sections from which Prof. Dong and I have recently described conodont faunas. During the year I have worked on Middle Ordovician Trenton conodonts (with Jeff Richardson), L. Ordovician conodonts (with A. Lofgren), other Swedish and North American conodont projects, and L. Ordovician conodont diversity and the biogeographic relations between the Precordillera of Argentina and Texas (with G. Albanesi). During 2001, I authored or co authored six published papers and seven published abstracts.

BOYCE, W. DOUGLAS (Canada). My investigations of western and central Newfoundland trilobite faunas continue. I am involved in ongoing collaborations with J. Christiansen (isotope stratigraphy), D.A.T. Harper (brachiopods), I. Knight (stratigraphy) and S. Stouge (conodonts) on platform sequences of west Newfoundland and North-East Greenland, as well as with D.M. Rohr and E.A. Measures (gastropods). The database of Newfoundland and Labrador fossil localities currently occupies a large portion of my time.

BRUSSA, EDSEL D. (Argentina). I am actively working with Ordovician graptolites from the Precordillera and Northwestern Argentina. In the Precordillera the work comprises early Darriwillian and late Bolindian faunas in a collaborative research leaded by Chuck Mitchell and Dan Goldman related to graptolite macroevolution. In Northwestern Argentina the work is concentrated in the western border of the Eastern Cordillera and in the Puna region. Actually I am studying Late Tremadoc/Early Arenig graptolites assemblages from volcanic-sedimentary rocks in the Susques area in the Puna. A reexamination of the Rusconi and Loss collections from the museums of Mendoza and Jujuy, respectively, is going on. I am, also, involved with Patrick Racheboeuf in the study of Ordovician phyllocarids from Argentina.

CHEN, XU (China). I am actively working on the latest Ordovician graptolite mass extinction and recovery based on the data from the Yangtze region. Have published the stratigraphic report (Chen et al., 2000, Geol. Mag.) and will submit two long papers with Fan Jun-xuan, Mike Melchin and Chuck Mitchell on the Hirnantian graptolites and the processes and characters of the latest Ordovician extinction respectively. Besides, I have submitted another paper with the colleagues as mentioned above on the Ashgillian graptolite biogeography. Also, I spend a part time working on the base of the Middle Ordovician of China and am preparing a manuscript with Stig Bergstrom and other colleagues based on a new section from the Hengtang quarry of the JCY area, Zhejiang, South China. I have joined with Strig in his project on Caradocian C13 isotopic analysis and provide data from three sections in the Low Yangtze region.
In the coming year, I will start to work on the early Rhuddanian graptolites and the graptolite recovery and radiation. An additional field work will be arranged in September and October of 2002 in Xinjiang for the Dawangou section, which was selected as the auxiliary section of the base of Upper Ordovician, and the early Rhuddanian graptolites as well as the base of the Ashgillian stage in Guizhou, China.

CHOI, DUCK K. (Korea). I am presently working mainly on trilobites of the Cambrian-Ordovician boundary intervals in Korea. During the last couple of years, we have measured a good exposure of the Cambrian-Ordovician sequence in Taebaek area and were able to locate some fossiliferous horizons. They appear to be very important not only in revising the presently poorly understood biostratigraphy of the lower Paleozoic Taebaek Group, but also in yielding some echinoderms recorded for the first time in Korea. Aside from the trilobites, one of my graduate students (Seung-Bae Lee) will work on the echinoderm material in conjunction with Bertrand Lefebvre (France).

CLARKSON, EUAN (United Kingdom). I'm currently working with Franco Tortello on the ontogeny of *Jujuyaspis keideli*. Franco was able to visit Edinburgh between 1 September and 15 October 2001, generously supported by grants from the Royal Societies of Edinburgh and London, and he brought with him superb material from NW Argentina. We made great progress during his 6 week visit, and it was highly successful; he is continuing the work in La Plata. I hope to visit Argentina after my official retirement in September this year.

COCKS, ROBIN (United Kingdom). I have completed a substantial paper for the Natural History Museum Bulletin (with Leonid Popov and Igor Nikitin) on Caradoc brachiopods and ecology of the Anderken Formation, Kazakhstan, in which 62 species in 55 genera are described and illustrated, of which 4 genera are new. I have also (with Trond Torsvik) completed a global review of geography from 500 to 400 Ma, based on an integrated approach from both palaeomagnetism and faunas. I have also submitted a paper on key faunas along the Trans-European Suture Zone, with particular reference to the Holy Cross Mountains of Poland, which he believes to have been an integral part of the main Baltica terrane during the Lower Palaeozoic. I am currently nearly completing a substantial paper (with Richard Fortey) on Ordovician and Silurian faunas as they relate to terrane positioning, following an invitation from Earth Science Reviews.

COIRA, BEATRIZ (Argentina). Ordovician magmatism and metallogeny in Puna region, Argentina.

COOPER, ROGER (New Zealand). With Jörg Maletz, Jan Zalasiewicz and Linda Taylor, graptolite species lists and zonal ranges have been compiled for Baltica, Avalonia, and Australasia, as a basis for the analysis of diversity patterns in high, intermediate and low paleolatitudes, in Ordovician time (IGCP 410). Mean standing diversity in Australasia is, surprisingly, not significantly different from that of Avalonia, although total species diversity is significantly higher. Chapters on the Cambrian, Ordovician and Silurian for a forthcoming book revising the Geological Timescale (F. Gradstein editor, C.U.P.) have been submitted, jointly with Mike Melchin, John Shergold and Pete Sadler, and use the new CONOP-based timescale for the Ordovician and Silurian (Sadler and Cooper in prep.). The Sadler and Cooper Ordovician timescale has been adopted by IGCP 410, and a summary is included in the book (submitted). A Hirnantian brachiopod-trilobite assemblage, discovered in New Zealand many years ago, has been confirmed during a recent visit by Robin Cocks, and is being described (Cocks and Cooper). It is the first confirmation of the fauna in Australasia.

DOLGOV, OLEG (Russia). I am an undergraduate student of paleontology at Department of Paleontology in St. Petersburg State University (Russia). I am currently working on trilobites and biostratigraphy of the Ordovician of St. Petersburg region. My taxonomic work is currently focused on representatives of the genus *Lonchodomas*. I also take a part in activities of the Ordovician research group of the Student Paleontological Society (Russia).

DRONOV, ANDREI (Russia). I am continuing my studies on sequence stratigraphy, sedimentary environments, facies, precise correlation and sea-level changes in the Ordovician of Baltoscandia. Ongoing projects includes: 1) Detailed sea-level story and precise interconfacies belts correlation in the Volkhovian (Arenig) of Baltoscandia (together with A. Nielsen and D. Harper); 2) Complex investigation of the unique Ordovician section at Mishina Gora (Pskov Region) impact structure; 3) Ichnological evaluation of the Arenig in St. Petersburg Region (with R. Mikulas); 4) Ordovician depositional sequences and sea-level changes in Baltoscandia (with Lars Holmer); 5) Comparative analysis of cool-water (Lower and Middle Ordovician) and tropical (Upper Ordovician) carbonate microfacies from St. Petersburg Region.

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. The world=s biggest trilobite, a Late Ordovician giant discovered during this project, appeared on the cover of Geology 28(10). Dong-Jin Lee (Korea) and I are examining the paleobiology of tabulate corals from the Middle Ordovician of Tennessee and Upper 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 (M.Sc. student) is finishing a thesis the paleoecology and paleoenvironments of the famous Late Ordovician ATyndall Stone@ in southern Manitoba. M.Sc. and Ph.D. projects are available (please see http:// www.umanitoba.ca/geoscience/faculty/elias)!

ERDTMANN, BERND-D. (Germany). Due to the preparatory work for and eventual approval of the Sino German Cooperation Project on the "Neoproterozoic to Early Cambrian Bioradiation Event" Bernie Erdtmann´s Ordovician research got somewhat into the "backwaters" during 2001. The most significant part of Ordovician research in 2001 was the fact that Prof. Dr. Yuandong Zhang from NIGPAS in China arrived here in February 2001 to commence a joint investigation of Tremadoc graptolite sequences in both China and in Scandinavia.

For example, "Hunnebergian" graptolites were practically unknown so far in China. During July and August 2001 Yuandong ZHANG accompanied me to several of the classical Norwegian Tremadoc graptolite sections at Slemmestad near Oslo and to the Hunneberg Mountain in Västergötland in Sweden. At Slemmestad a complete black shale sequence ("Ceratopyge Shale and Limestone" plus Hagastrand Member of the Toyen Formation) was measured on centimetric scale covering the interval between *Rhabdinopora praeparabola* and *Paratetragraptus approximatus.* The result of this fieldwork will be published jointly and a new set of zonal ranges is to be expected for this important stratigraphic interval. During March and April 2001 Bernie Erdtmann was invited to southern Korea by Profs. Duck Choi and Jeongyul Kim and his coworker Youngpil Jin to investigate a fabulous newly discovered "middle" Tremadoc graptolite sequence of the Mungok Fm. This sequence may yield the essential data surrounding the stratigraphic position "problem" of *Psigraptus* and associated forms. More will come later because several manuscripts are "under construction" both with Yuandong Zhang on the Jilin Psigraptus and with the Korean colleagues on the Jeongwol (Mungok Fm.) occurrences.

ESTEBAN, SUSANA (Argentina). I´m working on the sedimentology of the Ordovician fine-grained sequences, specially in black shale facies, from northwestern Argentina and Famatina Range. In collaboration with Franco Tortello, I´m studying the stratigraphy and biostratigraphy of the Cambrian-Ordovician boundary in the norther Argentina. With Udo Zimmermann, I´m analysing the provenance of the lower Paleozoic sediments of the Famatina region.

EVANS, KEVIN RAY (USA). I'm actively working with colleagues on the gamma-ray stratigraphy, sequence stratigraphy and large-scale depositional patterns of Middle Cambrian through Lower Ordovician strata in the Great Basin, USA and Baltica.

FERRETTI, ANNALISA (Italy). A preliminary report on Late Ordovician conodont faunas (with special attention to a Hirnantian association) from the Austrian Carnic Alps was recently published (with Hans Peter Schönlaub) and a new sampling there was completed. Several Late Ordovician sections in Brittany (NW France) are currently under investigation (with Enrico Serpagli). Work on the Whitland Section (South Wales) with Chris Barnes is in progress. An Early Ordovician association from Montagne Noire will soon be described (with Enrico Serpagli).

FINNEY, STAN (USA). I am on sabbatical leave during the Spring 2002. Most of that time (March 1 to June 30) will be spent in Austria where I will hold the position of J. William Fulbright Distinguished Chair in Natural Sciences at the University of Salzburg. I will remain in Europe until the end of July. I will use the time to write papers, to visit the Ordovician/Silurian sections in the Carnic Alps, and to visit colleagues whenever and wherever possible in Europe. I hope to attend the dedication ceremonies for the Diabasbrottet and Fagelsang GSSPs in Sweden in July. I will also be busy as organizing chair for the ICS's First Meeting on Future Directions in Stratigraphy, which will be held in Urbino, Italy, 14-16 June 2002. The purpose of the meeting is to develop a strategic plan for a future mission of the ICS.

FORTEY, RICHARD (United Kingdom). This year I have been Collier Professor in the Public Understanding of Science at the University of Bristol, so I have been writing a book as my day job, rather than burning the midnight oil as usual. In my free time I have completed a couple of papers of Ordovician interest, one with Robin Cocks is an Earth Science Review on palaeo-biogeography, a general summary of what we know which can be used as an "Aunt Sally" for future generations, the other, with Adrian Rushton, a new aglaspidid from Wales - a real surprise from the *Angelina sedgwickii* beds, known for 150 years.

GANIS, G. ROBERT (USA). I am describing the Ordovician graptolites from the Taconic Hamburg/ Martinsburg Terrane in Eastern Pennsylvania, USA as part of my thesis at the University of Leicester, UK. Jan Zalasiewitz is my supervisor. My collection was delivered to the Natural History Museum in London, and I am working from that base under the guidance of Adrian Rushton and Richard Fortey. I will be there until the end of August 2002. Returning to University to study palaeo and biostrat after a long career in economic geology is a real thrill and a challenge.

GHOBADI POURM, MANSOOREH (Iran). I am currently working on Ordovician juvenile trilobites of Kazakhstan and a collection of Ordovician trilobites from Eastern Alborz, Northeast of Iran. I am interested in studying biogeography, biofacies and evolution of trilobites too. I am at the beginning but I hope to access some useful results in near future.

HAMMANN, WOLFGANG (Germany). I am currently working on the following projects: Description of trilobites from the Tremadoc-Arenig sequence of the Iberian Chains, NE Spain. The fauna comprizes the genera *Micragnostus, Geragnostus, Leiagnostus, Brackebuschia, Euloma, Angelina, Leptoplastides,*

Hypermecaspis, Parabathycheilus, Prionocheilus, Asaphellus, Ekeraspis, Niobella, Dikelokephalina, Dactylocephalus, Ceratopyge, Macropyge, Apatokephalus, Symphysurus, Asaphelina, Orometopus and *Anacheirurus*. A special fauna has been discovered in the Armorican Quartzite, Arenig, including lingulids, Asaphellus, bivalves (Babin & Hammann, 2001), gastropods, conularians and a new synziphosurine. Remains of the latter are still incomplete and further collecting is planned.
Description of trilobites (*Geragnostus, Asaphellus, Dikelokephalina, Asaphopsoides, Platypeltoides, Apatokephalus, Orometopus, Bavarilla, ?Beltella, Parabathycheilus, Prionocheilus, Anacheirurus*) from the Lower Fezouata Shale Formation, Tremadoc, of the Moroccan Anti-Atlas in cooperation with J. Destombes.
Both these projects on the Lower Ordovician are in advanced stage and hopefully will be finished during this year.
Trilobites from the Upper Ordovician of the Austrian Carnic Alps, in cooperation with H. P. Schönlaub, Vienna. Collecting carried out during the years 2000 and 2001 by me has yielded rich and partly highly diverse trilobite faunas from almost all lithological units, including the deep water Uggwa facies as well as the shallow water Wolayer fazies sequences. The fauna comprizes a large spectrum of species known from the Kralodvorian of Bohemia, Sardinia and Spain, respectively. Further field work is necessary.
The second part of the monograph on the Upper Ordovician trilobites of Sardinia (Hammann & Leone) will be printed during this year in Beringeria.

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 Nielsen). Expeditions to East Greenland during 2000 and 2001 have helped develop a new stratigraphy for the region, providing a framework for the many new fossil discoveries. Fieldwork in western Russia is helping tie down the relationships between 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 others on refining events during the late Ordovician and early Silurian in South China, a critical area for the understanding of the Hirnantian Substage.
Øyvind Hammer has continued his work on the Baltoscandian database with assistance from many palaeontologists in the region. Further enhancements of PAST have increased the popularity of this free software package for palaeontologists (*PAST - PAleontological STatistics Software. Version 0.7*. http://folk.uio.no/ohammer/past).
An extensive chapter on Ordovician brachiopod diversification has just been completed in connection with IGCP project 410. Both the taxonomic and ecological components of the radiation have been tackled by a range of authors.
Copenhagen hosted two major conferences during 2001. WOGOGOB (May 2001) attracted over 45 delegates for two days of talks and posters on the Ordovician Geology of Baltoscandian (see Harper and Stouge 2001) followed by a field excursion to nearby Scania. A number of the papers will be published later this year in a thematic volume of the Bulletin of the Geological Society of Denmark. The Annual Meeting of the Palaeontological Association (December 2001) attracted about 230 delegates; a significant number of presentations involved Ordovician biotas (see Harper 2001).

HARRIS, MARK (USA). I am currently working on a collaborative project with Peter Sheehan (Milwaukee Public Museum), Leho Ainsaar (Tartu University), Linda Hints (Institute of Geology, Tallinn), Peep Mannik (Institute of Geoogy, Tallinn), Jaak Nolvak (Institute of Geology, Tallinn), and Madis Rubel (Tartu University) to compare Late Ordovician-Early Silurian facies, sequence stratigraphy, faunas and community evolution of western Laurentia (Great Basin) and Baltica (Estonia).

HEUSE, THOMAS (Germany). I am continuing mapping and stratigraphical work in the Neoproterozoic and Lower Palaeozoic of Saxo-Thuringia, Germany.

HEREDIA, SUSANA (Argentina). I´m actively working on lithostratigraphy of some Ordovician sections from Mendoza province. Joint papers with Matilde Beresi on detailed revision of the Empozada Formation and Ponón Trehué Formation is almost finished. I´m continuing work on *Eoplacognathus* species from Mendoza Province.

HINTS, LINDA (Estonia) is currently working on the project "Comparative study of the Early Palaeozoic faunas of Estonia and surrounding areas; creation of the paleontological database" The project team deals with selected problems concerning faunas and stratigraphy from Cambrian to Silurian. In the frame of the main project I am working on the sub-project "The Baltic faunal province and development of its biota in the Ordovician" (duration of the sub- project 2001-2003). A short review of the brachiopod faunas in the East Baltic was presented in collaboration with D.A.T. Harper on the Millennium Brachiopod Congress and a paper was published in the Congress volume. Here I would like to apologize to all colleagues, especially those working on

the Tremadoc of Baltoscandia, for a foolish mistake I made in the mentioned paper. In some figures the Varangu Stage is shown below the Pakerort Stage; it should be above the latter.
An American-Estonian team (P. Sheehan, M.Harris, L. Ainsaar, M. Rubel, P. Männik, J. Nõlvak and LH) studies comparatively the Upper Ordovician- Silurian sections in the Great Basin and East Baltic for testing of the synchrony of sequences and faunal changes. I am working also on the project "Study and protection of the unique geological objects" in the frame of which we have collected the fossils in the working quarries and try to fix there some unique geological phenomena coming in sight due to the mining.
The study of the geo- and bioevents in the Baltic Basin continues in the collaboration with my colleagues D. Kaljo, J. Nõlvak, T. Martma and also with colleagues in Liverpool J. Marshall and P. Brenchley.

HINTS, OLLE (Estonia). I'm continuing research on Ordovician scolecodonts, especially their taxonomy and distribution. Several new taxa collected from the Baltic region are being prepared for a publication, and some aspects of functional morphology of polychaete jaws are also of interest. I'm about to defend my PhD devoted primarily on Ordovician scolecodonts in spring 2002. Together with M. Eriksson (Lund University), we finished a small contribution to the IGCP 410 bringing together the information available on all known Ordovician jawed polychaetes. In 2001 a small project started together with T. Meidla (Tartu University) and few others to detect possible biotic effects of Ordovician volcanic ashfalls (the Kinnekulle ashfall in particular) in North Estonia; first results show major impact on ostracodes, whilst other groups studied seemed to be less affected. The results are submitted to the WOGOGOB 2001 volume. The work will probably continue, and some new groups will be incorporated. I am also managing the collections database at the Institute of Geology at Tallinn Technical University, which contains a growing number of records on Ordovician fossils. In addition to specimen-level data, registration of geological localities, references and other related information is in progress and an image database and GIS connected to collections data are being implemented. Part of the database is publicly accessible at http://collections.gi.ee/.

KALJO, DIMITRI (Estonia): I'm working in the field of the Ordovician geology together with a group of colleagues from our institute (L. & O. Hints, M-A. Motus, J. Nolvak) on two ongoing projects, where my personal interests are concentrated on (1) the carbon isotope stratigraphy of the Baltic Caradoc and Ashgill rocks (with T. Martma as an isotope man) and (2) the Hirnantian rugose coral assemblages and biodiversity changes in the specific environmental context. Here a cooperation with Björn Neuman (now in Karlstad, Sweden) is successfully going on.

KEY, MARCUS (USA). I am working in the Middle Ordovician Duncannon Group in southeastern Ireland. Along with Patrick Wyse Jackson at Trinity College, Dublin and Caroline Buttler at the National Museum of Wales, we are interested in first describing its bryozoan fauna, determining its paleoenvironmental setting based on hemispherical bryozoan colony morphologies, and quantifying carbonate production rates in the ramose bryozoans. This final goal will involve examining seasonal profiles in oxygen isotopic ratios through the skeletal carbonate.

KOCH, LUTZ (Germany). I'm continuing work on Ordovician faunas, biostratigraphy and palaeo-biogeography. Two papers dealing with Ordovician trilobites from the Condroz Ridge, Belgium, being studied from a palaeogeographic point of view are in preparation (one in collaboration with Bob Owens and Thomas Servais, and the other jointly with Jean-Louis Henry). A paper on the Chitinozoa biozonation of the Ordovician of the Ebbe Anticline (Germany) has been submitted (co-operative work with Joakim Samuelsson, Axel Gerdes, Thomas Servais, and Jacques Verniers). With Klaus Eiserhardt I cooperated on an article, the revision of the ichnogenus *Tomaculum*, which has been published in late 2001. Finally a paper on the new evidence for the synonymy of the Lower Devonian phyllocarid genera *Dilophaspis* and *Nahecaris* has been submitted (jointly with Carsten Brauckmann and Elke Gröning).

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 with G. Sarmiento (Spain) and Yakut Goncuoglu (Turkey) on

Ordovician stratigraphy of the Taurus Belt in Southern Turkey. With J-F. Ghienne, O. Monod and W.T. Daen we are also studying the latest Ordovician glaciation event in southern Turkey.

KRAFT, JAROSLAV (Czech Republic). I have studied Ordovician graptolites, stratigraphy and faunal dynamics especially in the Barrandian (Czech Republic). Currently I study new graptolite fauna of the upper Arenigian – lower Llanvirnian and prepare some databases of the Bohemian Ordovician localities (a project of the Ministry of Culture of the Czech Republic) and graptolite species of Bohemia together with Petr Kraft. I participate in the project (supported by Grant Agency of the Czech Republic) on overall paleontological and stratigraphical study of the Klabava Formation (?Tremadocian-Arenigian).

KRAFT, PETR (Czech Republic). I have have continued in study of Lower and Middle Ordovician graptolites, problematic fossils, stratigraphy and other aspects in the Barrandian (Czech Republic). I study new graptolite fauna of the upper Arenigian – lower Llanvirnian and prepare some databases of the Bohemian Ordovician localities (a project of the Ministry of Culture of the Czech Republic) and graptolite species of Bohemia together with my father Jaroslav. I participate in the project (supported by Grant Agency of the Czech Republic) on overall paleontological and stratigraphical study of the Klabava Formation (?Tremadocian-Arenigian). I also participate in investigation of chaetognaths and protoconodonts with O. Lehnert and minor study on ichnofossils together with J. Slavickova.

LEGRAND, PHILIPPE (France). I am continuing my researches on the Caradoc of Algerian Sahara and the Late Ordovician glaciation (Ashgill).

LEHNERT, OLIVER (Germany). This May I will move to Prague/Czech Republic for one year (Humboldt Fellowship) to work with Petr Kraft and Olda Fatka on different topics in the Cambro-Ordovician of the Barrandian area. Material from these clastic peri-Gonwana successions was already sampled last year and Ordovician conodonts at housed Czech Geologigal Survey will be included in the studies. Research in the Prague Basin will include conodonts, associated microfossils (e.g. paleoscolecidans) and geochemistry (carbon isotopes). Last fall I shipped the last (?) samples of my current Great Basin project home to Germany. Several tons of dolomites were pushed through the acid during the last years and hopefully I'll get some of the conodonts material done during my stay in Prague too. The goal is finally to work out a detailed biostratigraphic and sequence stratigraphic framework for the Upper Cambrian through Upper Ordovician strata of the southwestern Great Basin with my friend and collegue John Cooper. Recent field work concentrated mainly on outer shelf and slope sections in Death Valley National Park and the southern Inyo Mountains (California). Godfrey Nowlan and I have to document allochthonous conodont faunas from Tertiary and conodonts from Cambro-Silurian sections on Ellesmere Island (Canadian Arctic). Additionally, there are still several minor projects in line to and wait to be finished up like e.g. on different associated microfossils groups from different regions, and on microfossils from glacial erratics in northern Germany.

LENZ, ALFRED (Canada). Dennis Jackson (UK) and I are in the final stages of our studies of the graptolites from the very fine approximately 200 m thick Tremadoc sequence of northern Yukon, and a third paper on that sequence is approaching completion. We recognize the following biozones, expanded and revised from the previous paper (listed older to younger): *Staurograptus dichotomus* and *Anisograptus matanensis* for the Lower Tremadoc, and *Adelograptus* cf. *tenellus*, *Adelograptus antiquus*, *Kiaerograptus pritchardi*, and *Hunnegraptus copiosus -Paradelograptus kinnegraptoides* for the Upper Tremadoc. In this same paper we erect a new genus, *Ancoragraptus* (based on *Adelograptus*? *bulmani* Spjeldnaes) from the *tenellus* Biozone, and a new species, *Kiaerograptus*? *kutchini*, from the *pritchardi* Biozone.

LI, JUN (China). I am working on the Ordovician, Silurian and Devonian palynomorphs from China. I am involved in several projects dealing with Yantze Platform, South China ,Tarim Basin, NW China and North China (Sino-Korea Platform). I visited Senckenberg Institute in the May, 2001 to work with Rainer Brocke and we present an talk in the 15th International Senckenberg Conference. In the September, 2001 I visited Lille to work with Thomas Servais and we also present talk and poster in the Conference of Early Palaeozoic Palaeogeographies and Biogeographies of Western Europe and North Africa. In November 2001, Thomas visited me in Nanjing.

LÖFGREN, ANITA (Sweden). Together with Viive Viira and two other female co-authors I have just published a paper on conodonts from the N Estonian Lower Middle Ordovician Mäekalda section (Viira et al. 2001). Cooperation with Viive continues, now on the Arenig part of the Cape Pakri section, also in N Estonia. In cooperation with Stig M. Bergström I have looked at conodonts from the P. proteus Zone at Holsbrotten, a section close to the proposed stratotype at Hunneberg, Västergötland. I also continue work on early Llanvirn

biostratigraphy in Sweden, which is budding off some taxonomic work on conodonts as well. In this context I have cooperated with Tatiana Tolmacheva and Zhang Jianhua.

MACCRACKEN, SANDY (Canada). Continue to work on Middle Ordovician and Silurian conodonts from various locations in Canada, and Devonian of western Canada.

MÁNGANO, MARÍA GABRIELA (Argentina). At present I am working on the ichnology, sedimentology and sequence stratigraphy of Ordovician and Cambrian clastic successions of northwest Argentina Ongoing research focuses on paleobiologic aspects of marginal-marine to shallow-marine ichnofaunas, and the relationship of trace fossils with sedimentary facies within a sequence stratigraphic framework (together with Luis Buatois). The ichnologic record of the Ordovician radiation is the subject of a manuscript (coauthored with Mary Droser) to be published in the coming book of the IGCP 410 Project "The Great Ordovician Biodiversification Event" A review on the depositional evolution of the Famatina Basin is also in progress. At present, I´m coordinating with Barry Webby a Symposium on Trace fossils in the First International Paleontological Congress (Sidney, Australia).

MÄNNIK, PEEP (Estonia). I am actively working on the evolution, ecology and taxonomy of Ordovician and Silurian conodonts from the Baltic, Arctic regions and Siberia, and on conodont-based high-resolution stratigraphy. Several joint studies continue: composition, distribution and evolution of Silurian conodont faunas (with Lennart Jeppsson); comparing Upper Ordovician Lower Silurian carbonate platforms in Estonia and the 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, St Petersburg, Syktyvkar, Ukhta and Novosibirsk); taxonomy, distribution and evolution of *Walliserodus* (with James E. Barrick).

MEISEL, SÖREN (Germany). I'm actually holding a research position at the Museum of Mineralogy and Geology in Dresden. My works still go on the Middle and Upper Ordovician successions of the Saxothuringian zone (E-Germany) and lead into the Lower to Middle Ordovician of the N-Eifel (W-Germany). Over the past few months, activities have extended to the Silurian and Lower Devonian rocks of Thuringia. Currently, works provide geochemical logs and encompass palynological analyses of the Griffelschiefer, the Hauptquarzit, the Lederschiefer (Darriwilian - Ashgill), the Untere and the Obere Graptolithenschiefer and the Ockerkalk Formations. Most of my undertakings are carried out in collaboration. Furthermore, the sedimentology of the deposits of the 'Ashgillian glaciation' of NW-Africa and of the Iberian peninsula are still, as ever of special interest for me and become examined to improve the reconstruction of the peri-glacial proximal to distal environment and of the ice shield dynamic on the Gondwanan borderland.

MERGL, MICHAL (Czech Republic). I am currently finishing the work on organophosphatic brachiopods of Tremadoc to Llanvirn age in the Barrandian. The monograph is submitted and will appear next year, with 89 species described. My interest is concerned especially to Tremadoc faunas.

MODZALEVSKAYA, TATIANA (Russia). I´m actively working on studing Late Ordovician-Early Devonian brachiopods of Russian Arctic (Severnaya Zemlya, Novaya Zemlya Archipelagos and Kotelnyi Island). Atlas on Ordovician and Silurian brachiopods of Taymyr Penninsula is in press.

NICOLL, BOB (Australia). I continue to work with Late Cambrian to Early Ordovician conodont faunas from central and Western Australia. This includes a very small fauna from the Carnarvon Basin in Western Australia that substantiates the occurrence of Ordovician sediments in that basin. Papers on the apparatus structure and biostratigraphic distribution of Oepikodus, with Ray Ethington and Ian Stewart are in press.

NOLVAK, JAAK (Estonia). I am actively working on Ordovician chitinozoans and biostratigraphy from the Baltoscandian sections with my Estonian and British colleagues, focusing on the Upper Ordovician, and with Polish colleagues (Z. Modlinski, B. Szymanski) on two sections through whole Ordovician. I am involved in the activities of IGCP no 410 Chitinozoa Clade Team (leader F. Paris) with material from Baltica.

NOWLAN, GODFREY S. (Canada). I am actively working on a number of projects: 1, Conodonts from the Cambro-Ordovician Deadwood Formation in Saskatchewan and North Dakota; paper submitted to Journal Paleontology (with S. Robson) on inarticulate brachiopods and conodonts from Alberta and Saskatchewan; 2, Conodont biostratigraphy and biofacies related to neodymium and carbon isotope signatures (with C. Holmden, University of

Saskatchewan) with the objective of tracking sea level on the North American craton during the Middle to Late Ordovician. A manuscript is in press on data from Iowa and Saskatchewan in Geochimica et Cosmochimica Acta (Fanton et al.); the work is being extended to another section in Saskatchewan; 3, 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; 4, Working jointly with Oliver Lehnert (University of Erlangen) on a study of clasts (mostly Ordovician) in a Tertiary conglomerate on eastern Ellesmere Island; 5, Conodont biostratigraphy of Cambrian to Silurian strata of eastern Ellesmere Island in support of geological mapping by K. Dewing and U. Mayr; 6, three manuscripts have recently been completed on the stratigraphy and biostratigraphy of Cambrian and Early Ordovician strata of autochthonous and allochthonous strata in southern Quebec (cooperative with O. Salad Hersi and D. Lavoie); 7, Paper completed on Ordovician conodonts from the Sops Head Complex, central Newfoundland (joint with B. O'Brien and B. McConnell); 8, Continuing biostratigraphic service work on Cambrian, Ordovician and Silurian conodonts from all over Canada.

ORTEGA, GLADYS (Argentina). I am working on late Tremadocian graptolite faunas from the Saladillo and Parcha formations (and its correlatives) from Eastern Cordillera of NW Argentina, and I continue studying lower, middle and late Ordovician graptolites from Argentine Precordillera. I continue to work with Guillermo Albanesi in a long term project trying to assemble a conodont-graptolite biostratigraphic scheme for the Ordovician System of Argentina. Currently, together with the Argentine graptolite working group I am involved in the organization of the 7th International Graptolite Conference, to be held in San Juan City, Argentina, in August 2003 (see 2nd circular included in present issue of Ordovician News, and the web site for further information: http://www.cricyt.edu.ar/ 2003.htm)

OWEN, ALAN (United Kingdom). Biodiversity change remains a major focus of my Ordovician activities, in particular the analysis of the faunas of the British Isles. In addition to various papers in press, including my contribution to the trilobite chapter in the IGCP 410 clade volume, I am also joint editor of a Special Publication of the Geological Society of London entitled Palaeobiogeography and Biodiversity Change: the Ordovician and Mesozoic-Cenozoic radiations. One of the papers in that volume is a joint contribution with Howard Armstrong which we are following up with an analysis of euconodont biogeography and the closure of the Iapetus Ocean. I have also restarted my work on Ordovician trilobites from Ireland, concentrating initially on the terranes in the Iapetus Suture Zone with Mike Romano. As for my research students: Alison Bowdler-Hicks is writing up her PhD thesis on the trinucleid trilobite Family Marrolithinae, Sarah Stewart has discovered an exciting range of obscure and neglected components in the Ordovician faunas of the Girvan district, S.W. Scotland and Kathy Keefe has made progress on the taxonomy and palaeogeographical origins of the Ashgill trilobites from Girvan.

PÄRNASTE, HELJE (Estonia). I am working on Baltoscandian cheirurine trilobites. A paper on Billingenian cheirurids is being amended in the light of referee comments, and now my work continues on pliomerids, pilekids, and encrinurids of the same age.

PERALTA, SILVIO H. (Argentina). I'm involved in various aspects of the Ordovician siliciclastic marine sequences of the Cuyo Precordillera, Western Argentina, mainly related to biostratigraphic, paleoenvironmental, and also, local, regional and global correlation. An important activity is closely related to develop of the Project "Ordovician Paleogeography of the Argentina Precordillera: Evidence from Neodymium Isotope Stratigraphy", supported by Petroleum Research Foundation-American Chemical Society (PRF-ACS), with Stanley Finney (California State University, Long Beach) and Jamie Gleason (Michigan University). The interpretation of the connection of the Precordillera with Laurentia and/or Gondwana during the Cambrian and Ordovician, are the main purpose of this project. The chemostratigraphic (Nd isotope) and biostratigraphic (based on graptolites and conodonts) are the tools to be considered useful to the study of the Ordovician siliciclastic sequence of the Precordillera.
On the other hand, we are carrying out, together with my colleagues of the Stratigraphy "task force" of the Institute of Geology (INGEO), San Juan University, for three years (2000-2002), a significant project, entitled : Stratigraphy and structure of the Ordovician and Silurian from La Dehesa creek, Central Precordillera of San Juan, Argentina. This project deal mainly on stratigraphic, biostratigraphic, sedimentologic and structural features of the upper part of the limestones of the San Juan Formation (Arenigian), and La Chilca Formation (Late Asghillian to Wenlockian) and Los Espejos Formation (Ludlowian to Pridolian). In this area, my colleague Estela Pereyra, is working on her Ph.D closely related to subject of the Project.
Moreover, I'm continue working on the graptolites of the *N. gracilis* Zone from the Los Azules Formation, at the

cerro La Chilca section, and the Las Aguaditas Formation, at the Las Chacritas section (La Trampa range), in San Juan Province. On the other hand, I'm carry out a strong revision of the Caradocian graptolites faunas of the La Cantera Formation, in the Don Braulio Creek, at the Eastern flank of the Villicum range. I'm working too on early Ordovician carbonate and mixed carbonate-siliciclastic sequences of the Gualcamayo Formation, at the Villicum range, and its correlative, which bears graptolites and/or conodont faunas, associated with trilobites, brachipods, sponges, bryozoans, and palynomorphs. In this case, the conodonts study is carried out by Susana Heredia (Comahue University, Neuquen Province), microfacies by Matilde Beresi (CONICET - CRICYT, Mendoza Province).
Finally, we are devoted, together with the Argentinian Ordovician colleagues on the 9th ISOS, 7th International Graptolite Conference and Field Meeting 2003 Silurian Subcommission on Stratigraphy, which will be held in conjunction in San Juan, Argentina, in August 2003.

PERCIVAL, IAN (Australia). I had a productive year, concentrating on Ordovician conodonts, both in Darriwilian cherts from the Lachlan Orogen in southern New South Wales, and from Early Ordovician limestones from the Koonenberry Belt in the far-western part of the state. A paper on the latter fauna (with Yongyi Zhen and Barry Webby) is now ready for submission. The first paper documenting conodonts on cherts from the Jindalee Group (southern N.S.W.) is now in review. Current Ordovician projects involve writing up the biostratigraphic results of an integrated study of mineralised volcanic arc deposits and associated sediments from the Macquarie Arc in central N.S.W., and collaborating with Yongyi Zhen and John Farrell (Macquarie University) on a paper describing Late Ordovician faunas from allochthonous limestones emplaced into Late Silurian sediments in this same region. I am also assisting Barry Webby in the editing of a book for Columbia University Press on The Great Ordovician Biodiversification Event, compiling results from IGCP Project 410. Dependent on sufficient interest being shown by delegates to the First International Palaeontological Congress being held at Macquarie University in July 2002, Ian will be co-leading a field trip to Ordovician graptolite localities in central and southern N.S.W. and the classic Victorian graptolite succession.

PIÇARRA, JOSÉ (Portugal). I´m actively working on the lower Paleozoic stratigraphy of the South Portugal (Ossa Morena Zone). Projects: IGCP 410 and 421. Portuguese-French cooperation, with R. Gourvennec, J. Le Menn and.M. Robardet.

PODHALAŃSKA, TERESA (Poland). I am actively working on stratigraphy, sedimentology and palaeoenvironment of the Upper Ordovician – Lower Silurian transition in the polish part of the Baltica palaeocontinent. I am currently involved in studies on stable isotopic stratigraphy in Ordovician to determine climatic and oceanographic changes Work is also continuing on bacterial paleontology and biomineralization in the Ordovician rocks.

POPOV, LEONID E. (Russia). I continue my work on the Ordovician brachiopods and biostratigraphy of Kazakhstan, Central Asia and Iran.

RASMUSSEN, JAN AUDUN (Denmark). I work now mainly on Mesozoic and Cenozoic foraminifera but there are still some time left for conodont studies. Most of this time is spend on Baltic, Early and Middle Ordovician conodont faunas from the Caledonides of Norway and Sweden (partly with Svend Stouge). The main topics are biostratigraphy and palaeoecology/biofacies. I am also working on Ordovician and Early Silurian, Laurentian conodonts from eastern North Greenland (with Paul Smith), where taxonomy, biostratigraphy and palaeo-biogeography are the main fields of interest.

VON RAUMER, JÜRGEN (Switzeland). I'm actively working on the comparison of palaeozoic lithostratigraphic columns, geochemistry of lower palaeozoic granitoids, and coordination of former peri-Gondwanan microcontinents hidden in the European Varican mountain belt. Most of the results were enabled through the very interesting new palaeotectonic reconstructions made by Stampfli and Borel.

RONG, JIAYU (China). Is continuing to work on the Ordovician brachiopod taxonomy, community and biogeography chiefly from South China.He is also working on mass extinction and subsequent biotic recovery in South China. He works together with Xu Hankui,Zhan Renbin and others on the diversity changes of brachiopods through Tremadoc to Ashgill based on the data derived from China. He has been working on the Aporthophyla fauna collected from the late Middle Ordovician (Darriwillian) of South China.

RUBINSTEIN, CLAUDIA (Argentina). I continue working on Ordovician acritarchs, cryptospores and chitinozoans from Puna, Eastern Cordillera, Famatina and Precordillera regions, in Argentina.

SALAS, MARÍA JOSÉ (Argentina). I´m doing research in the University of Córdoba, Argentina. Last year I

finished my PhD on Ordovician ostracods of the Argentine Precordillera. Now, I am publishing the taxonomic information that has emerged from it. I will start this year with the study of lower Ordovician ostracods from the northwestern of Argentina (Cordillera Oriental). My main fields of interest are taxonomy, paleogeography and paleoecology.

SARMIENTO, GRACIELA N. (Spain). I continue working on Ordovician and Silurian conodonts from Spain, Portugal, Morocco and Turkey.

SHAW, FRED (USA). I have retired from teaching and administration and seem to spend most of my time on long distance bike trips, returning most recently from Idaho and Wyoming. Costa Rica comes next. However, I maintain an office at Lehman and continue with research. Having finished the Kraluv Dvur trilobites (Bull. Czech Geol. Survey, many reprints left, get them while they're hot), I've spent some time with Godfrey Nolan sorting out Mingan paleontology. A summary work on the biostratigraphy, and systematics of various groups (including trilobites) is done and wandering through the GSC publication labyrinth.
The pitted fringe creatures continue to attract, although many of you may have had enough about them already. At the moment, I am chasing them around in the Hanson Creek Formation in Nevada. Depressingly, the morphologic sequence in Nevada seems the reverse of that in Oklahoma, and the ages don't match either. Coupled with this is a set of different forms of slightly later age turned up in the NWT by Brenda Hunda. On the other hand, this is a good excuse for more field work in Nevada -one of my favorite places. And now for something completely different, a small fauna from the Pratt Ferry of Alabama with telephinids and other odd things. Stop by when in New York -we're still here in spite of what you read.

SMITH, PAUL (United Kingdom). Work continues on the Ordovician of NW Scotland, Greenland and Svalbard with the aim of determining the Early Palaeozoic history of this sector of the Laurentian margin. Together with Phil Donoghue and Ivan Sansom (also Birmingham), work has also moved forward in describing Ordovician vertebrate faunas from Laurentia. A paper on Late Ordovician vertebrates is almost finished, and the new phylogenetic trees have been used to re-examine Ordovician vertebrate biogeography and to test molecular clock hypotheses for the divergence of major groups.

STOUGE, SVEND (Denmark). I´m actively working on following project: The upper Precambrian to lower Palaeozoic strata in North-East Greenland. The project is focusing on the Caledonian cyclus and development of the Laurentian passive margin in North-East Greenland and North Greenland and to integrate this study within the broader context of coeval sequences of other parts of the Iapetan margin. The work is an inter-disciplinary project and is carried out as a cooperation between the Geological Survey of Denmark and Greenland (S. Stouge), Geological Museum in Copenhagen (D.A.T. Harper), Holbæk College, Denmark (J.L. Christiansen) and the Department of Mines and Energy, St. John's, Newfoundland, Canada (W.D. Boyce and I. Knight). The project is supported by the involved institutes mentioned above, the Danish Natural Science Research Counsil and the National Geographic Society, Washington D.C. USA. A second activity involves detailed stratigraphic and palaeontological research on different parts the East European Platform. This project is carried out as a cooperation between the Geological Survey of Denmark and Greenland (S. Stouge), Geological Museum of Copenhagen, Denmark (D.A.T. Harper and A.T. Nielsen), Geological Survey of Estonia (T. Saadre), Tallinn Technical University (L. Hints), University of Tartu (T. Meidla) and University of St. Petersburg (A. Dronov). This project is funded by the Carsberg Foundation, Copenhagen, Denmark.

SWEET, WALTER C. (USA). I continue to work on assembling a high-resolution network of Ordovician strata in North America using the measured ranges of some 300 conodont species. Assembly methodology is graphic correlation and a preliminary study (with Albanesi) suggests that it may be possible to add Argentine conodont-range information to the North American Composite Standard. Work will continue on this possibility. A manuscript (by Sweet, Ethington and Harris) that reports on addition of typical Whiterockian strata to the evolving composite standard has languished in editorial hands for more than a year. We hope it will make it to publication sometime in 2002.

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.

TORO, BLANCA A. (Argentina). I am still working on Early Ordovician graptolites from North-western Argentina (Cordillera Oriental, Puna region and Sistema del Famatina). A synthesis of the main results in regards to the taxonomic revision, the biostratigraphic and paleogeographic schemes, and the correlation will be published in the IANIGLA Special Volume: "Thirty Years of Basic and Applied Research". I am actively participating together with colleagues from the Universidad of Córdoba, in a multidisciplinary three years project. This includes the study of the faunistic assemblages, high-resolution biostratigraphy and stratigraphy from the Ordovician sequences of the Argentine Cordillera Oriental. I am preparing a revision paper about *Didymograptellus bifidus* in North-western Argentina, and about the biostratigraphic and paleographic inferences from those records. I am also continuing with the study of the Middle to Upper Ordovician graptolites, proceeding from several southern sections of the Precordillera (Mendoza).

VANDENBROUCKE, THIJS (Belgium). I have recently started my PhD studies under the supervision of Jacques Verniers, Ghent University, Belgium. I am currently working on chitinozoans from the newly proposed GSSP for the base of the Upper Ordovician Series at Fågelsång (Scania Sweden) and from one of its UK equivalents, the Lower Wood Brook section in the Shelve Inlier (Meadowtown Wales), the latter in co-operation with Dr. R. Fortey. Further work will include chitinozoan studies of key Caradoc and Ashgill sections on the Avalonia and Laurentia palaeocontinents, mainly focussing on the UK this year. (Article accepted: Vandenbroucke, T., J. Verniers & E.N.K. Clarckson. A chitinozoan biostratigraphy of the Upper Ordovician and lower Silurian strata of the Girvan area, Midland Valley, Scotland. Transactions of the Royal Society of Edinburgh, Earth Sciences).

VERNIERS, JACQUES (Belgium). I am actively working on: a review on the lithostratigraphy of the Lower Palaeozoic formations of Belgium (in press); an excursion guide is prepared on the Lower Palaeozoic stratigraphy and sedimentology of the Brabant Massif in the Dyle and Orneau valleys and of the Condroz Inlier at Fosses (in press); with the PACE TMR network team we finished the project on the "Palaeozoic Amalgamation of Central Europe" (three papers in press); we finishing to work on the Chitinozoa of Avalonia for IGCP project 410 (the Great Ordovician biodiversification event) and continue on the Ordovician litho and biostratigraphy of Belgium.

VIIRA, VIIVE (Estonia). I am continuing work on Ordovician and Silurian conodonts and biostratigraphy. Research with Anita Lofgren on the early Arenig conodont faunas of Cape Pakri, Estonia continues.

WANG, XIAOFENG (China). I continue 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 He Weihong (geochemistry).

WEBBY, BARRY D. (Australia). Currently, together with Mary Droser, Florentin Paris and Ian Percival, co editing the Columbia University Press/IGCP 410 volume on the "Great Ordovician Biodiversification Event" in which more than 50 Ordovician clade group specialists and other Ordovician geologists have actively contributed. Chapters on virtually the entire range of clade groups, from large multi-authored contributions on trilobites, chitinozoans and echinoderms to small, sole author presentations on groups like the scolecodonts, phyllocarids, machaeridians and chaetognaths, have been submitted, as well as introductions to the Ordovician time scale, isotopes, climatology, oceanography, a major superplume event, major terranes and the end-Ordovician glaciation. These are now being edited and reviewed so the entire assembled volume can be submitted to the CUP printers by the end of year. Among my other activities, I expect the paper with Yongyi Zhen and Ian Percival of Lower Ordovician conodonts from the northern Molong Volcanic Belt (island arc) to be published this year in Courier Forschungsinstitut Senckenberg, and work on a larger manuscript by the same authors, on the Lower Ordovician conodonts from the Mt Arrowsmith area of western New South Wales, will be completed during the year. Also I will be activitely involvement with Chris Barnes and Ian Pervival in convening the final IGCP 410 meeting, in conjunction with First International Palaeontological Congress (IPC-2002) being organized by J. Talent, R. Mawson & G Brock (6-10 July) - for details see outline elsewhere in this issue of Ordovician News.

WELLMAN, CHARLES (United Kingdom). I am currently working on Ordovician land-derived palynomorph assemblages (cryptospores and phytodebris) from terrestrial and nearshore marine deposits from the subsurface of Oman.

WRONA, RYSZARD (Poland). I will continue research related to the IGCP 410 Project. I am going to study biostratigraphic and palaeobiogeographic utility of the early (Ordovician) Palalezoic Chitinozoa from Poland for understanding the origin and amalgamation history of the Caledonian terranes at the margin of Baltica paleocontinent, which are now situated within the Trans-European Suture Zone (TESZ) in Poland.

YOUNG, GRAHAM (Canada). I'm working on various aspects of 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 paper on corals of Laurentia has been prepared for a book on "The Great Ordovician Biodiversification Event" (IGCP 410). A large field project with Bob, Dave Rudkin, Godfrey Nowlan, and others assesses a paleoenvironments around a unique Late Ordovician-Early Silurian archipelago, in the Churchill area of northern Manitoba. Diverse fossils collected from this area include the world's biggest trilobite, a giant specimen of Isotelus (a manuscript on this discovery is in review; see also the cover of Geology 28(10)). I am examining various aspects of paleoecology and coral systematics for the Upper Ordovician of southern Manitoba. Stephen Kershaw (Brunel University, England) and I are completing a large project on growth banding in Paleozoic corals and stromatoporoids, comparing Ordovician material from Manitoba with Silurian fossils from Gotland. I continue to work on a project with Xu Shaochun (recent postdoctoral fellow) on remarkable Late Ordovician coral-stromatoporoid intergrowths from South China. Simon Wong (M.Sc. student) is completing a paleoecologic study of the Red River Formation in Manitoba.

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 North China is being prepared, together with a description of some late Tremadoc graptolites from Dayangcha, Jilin. 2) the bioradiation of early-middle Ordovision with Zhan Ren-bin and some other colleagues of mine in NIGP, China. In the fall of 2001, we took a field excursion to northern Guizhou and southern Sichuan, and collected abundant graptolites, brachiopods and trilobites from a variety of localities. Based mainly on a study of the graptolites collected last year and those previously available, a revised graptolite sequence for Yangtze Platform with a correlation to other continents has been suggested. A paper on the different biodiveristy patterns of Yangtze Platform and Jiangnan Slope of China will be finished soon. 3) the phylogenetic origin of earliest biserial graptolites, in collaboration with Prof. R.A. Fortey in UK.

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.

ZUYKOV, MICHAEL (Russia). I am currently working on brachiopods and biostratigraphy of the Ordovician of the Baltoscandia. The main topic is revised morphology, taxonomy and evolution of brachiopod Platystrophia and related genera. A taxonomic study of some early Caradoc brachiopods of western part of St. Petersburg region is also in progress. I also take a part in collective studies on the Ordovician biostratigraphy of the East Baltic as a part of the activities of the Student Paleontological Society (St. Petersburg, Russia).

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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

Leho AINSAAR
Institute of Geology
University of Tartu
Vanemuise 46, Tartu 51014
ESTONIA
Tel.: (+3727) 465 834
Fax: (+3727) 465 836
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
U.K.
Tel.: 0116 252 3610
Fax: 0116 252 3918
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
E-mail: H.A.Armstrong@durham.ac.uk

Ricardo A. ASTINI
Estratigrafia y Geologia 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: rastini@satlink.com

Gabriella BAGNOLI
Dipartimento di Scienze della Terra
Via S. Maria, 53
56126 Pisa
ITALY
Tel.: +39 050 847239
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 PLEASE USE THIS NEW ADDRESS, CURRENT AT October 2001 (previously Bassett@cardiff.ac.uk or sglmgb@altavista.com)

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

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@onenet.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: 1) stig@geology.ohio-state.edu
2) Bergstrom.1@osu.edu.

Alain BLIECK
Université des Sciences et Technologies de Lille
Sciences de la Terre
Laboratoire de Paléontologie et Paléogéographie du Paléozoïque UPRESA 8014 et FR 1818 du C.N.R.S.
F-59655 Villeneuve d'Ascq Cedes
FRANCE
Tel.: +33 (0) 320 434 140
Fax.: +33 (0) 320 436 900
E-mail: Alain.Blieck@univ-lille1.fr
URL: http://www.univlille1.fr/geosciences/page_ufr/upresa_8014/upresa_8014.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
URL:http://www.sedimentology.geo.uu.se/palaeo.Personnelpages/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
URL: 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/index.html,
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 Gelogía 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

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.a.ckr

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
Instituto de Geología y Minería
Universidad Nacional de Jujuy
Casilla de Correo 258
4600 S.S. de Jujuy
ARGENTINA
Tel.: 54-388-4223057
54-388-4221593
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: CopeJCW@Cardiff.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

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@hotbox.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-CONICET
Universidad Nacional de Tucumán
Miguel Lillo 205
4000 San Miguel de Tucumán
ARGENTINA
E-mail: insugeo@unt.edu.ar

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 dell¹Orto 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
E-mail: scfinney@csulb.edu

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

G. Robert GANIS
P. O. 6128
Harrisburg, Pennsylvania 17112
USA
Tel.: 717 566 3417
Fax: 717 566 7768
E-mail: Bobganis@AOL.Com
(address until 27 August, 2002)
Kipling Drive
London, UK SW19 1TJ
Tel.: 020 8544 0672

Mansooreh GHOBADI POUR
Department of Geology
University of Esfahan
Esfahan, 81744

IRAN
Tel.: 0098 311 7932160
Fax: 0098 311 7932152
E-mail: mgp.palaeo@sci.ui.ac.ir and
m_ghobadipour@yahoo.com

Yakut GONCUOGLU
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

Mark HARRIS
Department of Geosciences
University of Wiscosin-Milwaukee
P. O. Box 413
Milwaukee, WI 53201
USA
Tel.: 414-229-2925
Fax: 414-229-6827
E-mail: mtharris@uwm.edu

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

Susana HEREDIA
Museo de Geología y Paleontología
Universidad Nacional del Comahue
Buenos Aires 1400
8300 Neuquén
ARGENTINA
Tel.: +54-(0)299-4490-393
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

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
Univ. of California-Riverside
Riverside, CA 92521
USA
Tel.: +1 (909) 787-2035
Fax: +1 (909) 787-4324
E-mail: anette@ucrac1.ucr.edu;
ahogstrom@hotmail.com

Warren D. HUFF
Department of Geology

University of Cincinnati
Cincinnati, OH 45221-0013
USA
Tel.: 513-556-3731
Fax: 513-556-6931
URL: 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

Marcus M. KEY, Jr.
Associate Professor of Geology
Department of Geology
P.O. Box 1773
USA
Tel.: 1-717-245-1448
Fax: 1-717-245-1971
Dickinson College
Carlisle, PA 17013-2896
E-mail: key@dickinson.edu
Homepages:
http://www.dickinson.edu/departments/geol/faculty_staff/key/
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 2130
E-mail: kraft@prfdec.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

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.an.cn

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: ichnolog@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: 403-292-6014
E-mail: samccrac@NRCan.gc.ca

Sören MEISEL
State Museum for Natural History Dresden
Museum for Mineralogy and Geology
Koenigsbruecker Landstrasse 159
01109 Dresden
GERMANY

Tel.: +49-351-8926-424
Fax: +49-351-8926-404
E-mail: 1) csm@rz.uni-jena.de,
2) meisel@snsd.de
URL: http://www.freesi.de; www.snsd.de

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 MIKULÁS
Institue of Geology, Academy of Science
Rozvojova 135, 165 00
Praha 6
CZECH REPUBLIC
Tel.: 00420-2-330 87 219
Fax: 0420-2-209-22-670
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)
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

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

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

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

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

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

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

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
URL: 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

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

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
URL: http:/www.gi.ee/~helje

Silvio H. PERALTA
Instituto de Geología (INGEO)
Facultad Ciencias Exactas, Físicas y Naturales
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: 703-648-5420
E-mail: 1) jrepetski@usgs.gov (work),
2) jrepetski@netzero.net

John F. RIVA
Quebec Geoscience Centre/
Centre géoscientifique de Québec
University of Quebec
880, chemin Ste-Foy, Suite 800
P.O. Box 7500
Ste-Foy, Quebec 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
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 Paleopalinologia
IANIGLA - CRICYT
C.C. 131
5500 Mendoza
ARGENTINA
Tel: +54-261-4287029/4274011
Fax: +54-261-4285940
E-mail: rubicaro@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)414 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.: 91-3944853
Fax: 91-3944849
E-mail: villasar@eresmas.net

Enrico SERPAGLI
Dipartimento di Scienze della Terra-Paleontologia
Via Università 4
41100 Modena
ITALY
Tel.: 0039-059-2056534
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@spyral.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: sherwinl@minerals.nsw.gov.au

Jana SLAVÍČKOVÁ
Department of Palaeontology
National Museum
Václavské nám. 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

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
not available at this stage).
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

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

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

Blanca A. TORO
Departamento de Geología y Paleontología
IANIGLA, CRICYT
Av. Ruíz Leal S/Nº
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

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

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

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

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. Koptyug 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

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
Nanjing Institute of Geology and Palaeontology,
Academia Sinica
East Beijing Road 39, Chi-Ming-Ssu
Nanjing 210008
CHINA
Tel.: 0086-25-3282145
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

Zhou ZHIYI
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

9TH INTERNATIONAL SYMPOSIUM ON THE ORDOVICIAN SYSTEM

7TH INTERNATIONAL GRAPTOLITE CONFERENCE

&

FIELD MEETING OF THE SUBCOMMISSION ON SILURIAN STRATIGRAPHY

ARGENTINA

San Juan, August 18-21, 2003

SECOND CIRCULAR

Under the Auspices of

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International Palaeontological Association
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ORDOVICIAN NEWS Nº 19

Argentine Geological Association
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National Academy of Sciences, Córdoba
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REGISTRATION FORM

Please return this form via e-mail (preferred), fax or mail **before December 15, 2002 to:**

ISOS (or joint registration: **ISOS-IGC-FMSSS**)
MATILDE S. BERESI
IANIGLA-CRICYT
Avda. Ruiz Leal s/n
Parque Gral.S.Martín
5500 Mendoza
ARGENTINA
E-mail: mberesi@lab.cricyt.edu.ar
(alternative e-mail: isos@lab.cricyt.edu.ar)
URL: http://www.cricyt.edu.ar/congresos/2003/default.html
Tel: 00 54-(0)261-4287029
Fax: 00 54-(0)261-4285940

IGC-FMSSS
GUILLERMO F. ACEÑOLAZA
INSUGEO
Miguel Lillo 205
4000 Tucumán
ARGENTINA
E-mail: acecha@unt.edu.ar
(alternative e-mail: insugeo@unt.edu.ar)
Tel./Fax: 00 54-(0)381-4253053

You will get a confirmation of reception by the secretaries.

Name and Surname:
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I will submit a paper to:
ISOS: YES - NO
IGC-FMSSS: YES - NO

I am interested in the following field trip/s:
Precordillera for ISOS-IGC-FMSSS (pre-symposia): YES - NO
San Juan River for ISOS-IGC-FMSSS (intra-symposia): YES - NO
Eastern Cordillera for ISOS (post-symposia): YES - NO
Eastern Cordillera for IGC-FMSSS (post-symposia): YES - NO

I am interested in the following alternative field trip/s:
Paraguay (previous to Precordillera): YES - NO
San Rafael Block (previous to Precordillera): YES - NO
Tandilia System (after Eastern Cordillera): YES - NO
Puna (after Eastern Cordillera): YES - NO
Bolivia (after Eastern Cordillera): YES – NO

Remind: ***Deadline for both, registration and deposit to ensure a place in a field trip: December 15, 2002 (registration payment is required on this deadline for those participants intending to submit a paper).***
Please, find a link to all forthcoming information at:
http://www.cricyt.edu.ar/congresos/2003/default.html