

SILURIAN TIMES

No. 20

(Year 2012)

Newsletter of the International Subcommittee on Silurian Stratigraphy



Year 2012
(Published March, 2013)

INTERNATIONAL SUBCOMMISSION ON SILURIAN STRATIGRAPHY (ISSS)

INTERNATIONAL COMMISSION ON STRATIGRAPHY (ICS)

INTERNATIONAL UNION OF GEOLOGICAL SCIENCES (IUGS)

**SILURIAN TIMES
THE NEWSLETTER OF THE
INTERNATIONAL SUBCOMMISSION ON SILURIAN STRATIGRAPHY (ISSS)**

**SILURIAN TIMES No. 20
for the year 2012 (published February 2013)**

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INTERNATIONAL UNION OF GEOLOGICAL SCIENCES

President: Prof. Dr. Roland OBERHAENSLI (Germany)

Secretary General: Dr. Dr. Ian LAMBERT (Australia)

<http://www.iugs.org/>

INTERNATIONAL COMMISSION ON STRATIGRAPHY

Chairman: Prof. Stanley Finney (USA)

Vice-Chairman: Prof. Shanchi Peng (China)

Secretary General: Prof. Paul R. Bown (UK)

<http://www.stratigraphy.org>

1. INTERNATIONAL SUBCOMMISSION ON SILURIAN STRATIGRAPHY (ISSS)

Subcommission officers

Chairman (sept. 2008-2012): Michael J. Melchin, Professor, Department of Earth Sciences, St. Francis Xavier University, P.O. Box 5000, Antigonish, Nova Scotia B2G 2W5, Canada, email: mmelchin@stfx.ca.

Vice Chairman (sept. 2008-2012): Peep Männik, Senior researcher, Institute of Geology at Tallinn University of Technology, Buildings 4C and 4A (3rd floor), Ehitajate tee 5, EE-19086 Tallinn, Estonia, email: mannik@gi.ee.

Secretary (2005-2012): Jacques Verniers, Research Unit Palaeontology, Department of Geology and Soil Science, Ghent University, Krijgslaan 281 building S8 WE13, BE-9000, Gent, Belgium, email: Jacques.Verniers@ugent.be.

List of Task Groups and their officers

Base of Silurian: Mike Melchin, Canada: mmelchin@stfx.ca (final report accepted in 2009)

Base of Wenlock: David Loydell, England: david.loydell@port.ac.uk

List of Titular Members (2012) (n=18)

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A. Le Hérisse (Brest, France), alain.le.herisse@univ-brest.fr

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Wang Yi (Nanjing, China), yiwang@nigpas.ac.cn

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EDITOR'S NOTES

For the last time I wish to thank again all of those who contributed to this issue and apologize to anyone whose contributions I may have inadvertently left out. We have received the current projects and recent publications of the titular or corresponding members. The list of Silurian workers who showed an interest to receive Silurian Times contains 279 persons. Possibly still more researchers want to inform the Silurian community about their current projects and publications. I have included all 155 references on Silurian publications that you sent me. On the other hand the email addresses bounces back to me from 51 emails addresses. If anyone could provide the (new) secretary with the new email addresses, this would allow better communication with all interested persons.

My thanks go to Brad for providing the front page with photos during the excursion in July 2012, part of the IGCP591 meeting in Cincinnati (Ohio) organized by Carl Brett and Brad Cramer.

Jacques Verniers, Secretary (February 2013)

THE WEB SITE FOR THE SILURIAN SUBCOMMISSION

The website for the ISSS (<http://www.silurian.cn>) is prepared by Fan Junxuan and Xudong Hou at the Nanjing Institute of Geology and Palaeontology, with input from the ISSS executive.

INTERNATIONAL SUBCOMMISSION ON SILURIAN STRATIGRAPHY (ISSS)

List of the corresponding members (situation end of 2012 n= 70)

(with year of election. Without date: corresponding members from before 1995)

Aldridge (UK)
Antoskhina (Russia)
Baarli (USA) 2002
Barnes (Canada)
Bassett (UK)
Bjerreskov (Denmark)
Blieck (France)
Bogolepova (UK) 2002
Boucot (USA)
Butcher (UK) 2011
Calner (Sweden) 2005
Caputo (Brazil)
Chen Xu (China)
Cocks (UK)
Corradini (Italy) 2007
Cramer Brad; (U.S.A.) 2009
Einasto (Estonia) 1996
Eriksson (Sweden) 2005
Fan Junxuan (China) 2005
Ferretti (Italy)
Fu Lipu (China) 1996
Geng Liangyu (China)
Gutierrez-Marco (Spain) 1995
Hansch (Germany)
Hints (Estonia) 2007
Histon (Italy) 2008
Holland (Ireland)
Huang Bing (P.R.China) 2009
Jell (Australia)
Jeppsson (Sweden) 1995
Kaljo (Estonia)
Kozłowska (Poland)
Larsson (Sweden)
Lenz (Canada)
Legrand (France)
Maletz (USA) 2002
Märss (Estonia) 1999
McLaughlin (USA) 2008
Modzalevskaya (Russia) 1999
Musteikis (Lithuania)
Nestor H. (Estonia)
Norford (Canada) 1995
Paris (France)
Piçarra (Portugal)
Radziadicius (Lithuania) 2007
Ray (U.K.) 2009
Robardet (France)
Rong Jiayu (China)
Schonlaub (Austria)
Sennikov (Russia) 1999
Serpagli (Italy)
Sherwin (Australia) 2009
Simpson (Australia) 2002
Slavik (Czech Rep.),
Storch (Czech Rep.)
Strusz (Australia)
Su Wenbo(China)
Suyarkova (Russia) 2007
Tang Peng (China) 2005
Teller (Poland)
Tesakov (Russia)
Vandenbroucke (France) 2011
Wang Jian (China) 2011
Wang Nianzhong (China) 1999
Wang Li (China) 2011
Wang Yi (China) 2005
Zhang Yuandong (China) 1999
Zhao Wenjin(China) 2009
Zhu Min (China) 2003
Zigaite (Lithuania) 2007

2. Chairman's Corner

Dear Silurian Colleagues,

2012 was a relatively quiet year for the ISSS. Many of the activities of ISSS members were associated with their involvement in IGPC 591: The Early –Middle Paleozoic Revolution. 2012 saw an ambitious program of meetings: the EGU General Assembly in Vienna in April; GSA North Central Symposium and Pander Society Meeting also in April; IGCP 591 Annual Meeting in Cincinnati in July; and the International Geological Congress in Brisbane in August. Publications stemming from several of these meetings are in preparation. We look forward to the continued IGCP 591 activity for 2013, especially the IGCP 591 Annual Meeting in Lund, Sweden June 9-19, 2013, which is being organised jointly with the International Subcommission on Cambrian Stratigraphy (ISCS), International Subcommission on Ordovician Stratigraphy (ISOS), International Subcommission on Silurian Stratigraphy (ISSS). I wish to thank Mikael Calner, Matts Eriksson and their team for agreeing to take on the hosting of the 2013 Silurian Field meeting, together with the IGCP 591 Annual Meeting. I am certain that it will be another productive meeting with the opportunity to visit early-mid Paleozoic exposures in Sweden and Norway. I strongly encourage all ISSS members to consider participating if possible.

I would also like to encourage ISSS members to continue research efforts toward a better understanding and revision of our Silurian GSSPs. I think that we built a strong momentum of interest in this at the Ludlow meeting and I and the ICS executive would like to see this momentum continue toward successful updating of our understanding and definitions of our series and stage boundaries. A working group for the base of the Aeronian has been struck and is being led by Petr Štorch, so if you are interested in participating in work on this boundary, you should contact him. Of course, any advances in the work on any of the other problematic boundaries would also be welcome. We have limited funding from the ICS to assist with work on our GSSPs so if you are interested, please contact me.

Looking forward to seeing you in Lund.

Mike Melchin



International Commission on Stratigraphy

Subcommission on Silurian Stratigraphy

ANNUAL REPORT 2012

1. TITLE OF CONSTITUENT BODY

International Subcommission on Silurian Stratigraphy ISSS

Submitted by:

Michael J. Melchin, *Chairman, ISSS*

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2. OVERALL OBJECTIVES, AND FIT WITHIN IUGS SCIENCE POLICY

Mission statement

The objectives of the Subcommission relate to three main aspects of IUGS policy:

- (1) The development of an internationally agreed scale of chronostratigraphic units, fully defined by GSSPs at Series and Stage levels and related to a hierarchy of units (Substages, Standard Zones, Subzones etc.) to maximize relative time resolution within the Silurian Period;
- (2) Establishment of frameworks and mechanisms to encourage international collaboration in understanding the evolution of the Earth during the Silurian Period;
- (3) Working towards an international policy concerning conservation of geologically important sites (such as GSSPs, global and regional stratotype sections, etc.).

Goals

- Rationalization of global chronostratigraphical classification.
- Intercalibration of fossil biostratigraphies, integrated zonations, and recognition of global datums.
- Establishment of magneto- and chemo-stratigraphic scales.
- Redefinition of stage boundaries and restudy of global stratotype sections.
- Correlation of Silurian rock successions and events, including marine and non-marine.

3. ORGANIZATION

The ISSS is a Subcommission of the Commission on Stratigraphy. The Subcommission is organized by an Executive consisting of Chairman, Vice-Chairman and Secretary, who are all Voting Members of the Subcommission. In the Subcommission elected for 2012-2016 there are twelve other Voting Members. The network of Corresponding Members has first of all a responsibility for communication in both directions between the Subcommission and researchers on Silurian topics in their region. Secondly they represent a broad spectrum of specialized stratigraphical disciplines from those

countries or regions where Silurian rocks are extensively studied in relation to fundamental and/or applied geological research.

Officers for 2012-2016:

Chair: Michael Melchin, Antigonish, Canada.

Vice-Chair: Peep Mannik, Tallinn, Estonia

Secretary: Renbin Zhan, Nanjing, China

Current research activities and future plans are communicated through publication of an annual ISSS newsletter, *Silurian Times*, distributed by both email attachment and as a web release.

Websites: <http://www.silurian.cn/home.asp> contains newsletters, meeting announcements, discussion posting-boards, bibliography of Silurian articles, links to related sites, and other information.

4. INTERFACES WITH OTHER INTERNATIONAL PROJECTS

Collaboration on IGCP Project 591, “The Early to Middle Paleozoic Revolution”, which was approved and began its work in 2011.

5. CHIEF ACCOMPLISHMENTS AND PRODUCTS IN 2012

Silurian Times No 19 was edited by the secretary in February, 2012, posted on the web site for the ISSS, and circulated as an email attachment to all titular, corresponding and interested members of the Subcommittee. It contained the reports on previous meetings, announcement of upcoming meetings and publications, and the latest news and recent publications on Silurian research.

A thematic volume of twelve papers emerging from the ISSS field meeting of 2011 was published in 2012 in the *Bulletin of Geosciences*, edited by David Loydell.

IGCP 591 held a special session at the International Geological Congress in Brisbane, Australia in August, 2012, co-organized by ISSS member Kathleen Histon and ISSS chair, Mike Melchin. IGCP 591 also held its annual meeting in July in Cincinnati, co-organized by ISSS members Carl Brett and Brad Cramer. Special symposium volumes are in preparation for both conferences.

6. CHIEF PROBLEMS ENCOUNTERED IN 2012

No major were encountered except for the old problem related to difficulties in obtaining grants for research on stratigraphical topics and travel to meetings of Subcommittee. Applications are often given low priority by national grant-awarding agencies. It would be helpful if IUGS emphasized to its member countries the importance it attaches to the GSSP programme and encouraged the relevant research funding bodies to give priority to funding relevant basic research.

7. SUMMARY OF EXPENDITURES IN 2012

Income	
Carried forward from 2011	nil
ICS Allocation	US\$6500
Total	US\$6500
Expenditure	
Expenses for ISSS Chair to attend IGC Brisbane	US\$2500
<u>Balance</u>	<u>US\$4000</u>

8. WORK PLAN, CRITICAL MILESTONES, ANTICIPATED RESULTS AND COMMUNICATIONS TO BE ACHIEVED NEXT YEAR (2013):

Regular updating the website for Silurian Subcommittee. We gratefully acknowledge the support of the Nanjing Institute of Geology and Palaeontology Academia Sinica for this work. It is planned that the ISSS web site will be migrated from the Silurian.cn domain to a .org domain, which also hosts the ICS web site.

Publication of Silurian Times Newsletter 20

ISSS Field Meeting in Lund, Sweden, together with IGCP 591, June 9-19, 2013 (see below).

Publication of a special volume of papers entitled “Siluro-Devonian Studies”, to be published as a Memoir of the Association of Australasian Palaeontologists.

The ISSS is a key partner in IGCP 591 – The Early to Middle Paleozoic Revolution. The planned milestone for IGCP 591 for 2013 is “Biological and chemical indicators of climate events”. The planned activities for IGCP 591 for 2013 are:

- IGCP 591 Annual Meeting, Lund, Sweden, June 9-19, 2013. The meeting will be organised jointly with the International Subcommittee on Cambrian Stratigraphy (ISCS), International Subcommittee on Ordovician Stratigraphy (ISOS), International Subcommittee on Silurian Stratigraphy (ISSS). Special volume in *GFF* (eds. Calner & Albanesi)
- 3rd International Conodont Symposium and IGCP 591 regional field meeting, Mendoza, Argentina , July 15-19, 2013, Organized by Guillermo L. Albanesi and colleagues.

Continued progress on the refinement of our understanding of Silurian GSSPs, particularly in collaboration with the ongoing regional mapping programme of the British Geological Survey in Wales and the Welsh Borders. In particular, collaborative studies of the chemostratigraphy and palynology of the Llandovery sections are under way and planned for 2013, and much of the focus will be through the current working group on the restudy of the Base of the Aeronian Stage. There will be a workshop at the Lund meeting dedicated to research on the base of the Aeronian and discussion of possible GSSP candidates. ISSS members will also visit selected GSSP candidate sections for study.

Focus of ISSS members on continued collaboration on the process of full integration of the various regional and global biostratigraphic, lithostratigraphic, sequence stratigraphic, and chemostratigraphic scales. This integration is essential for refinement of the Silurian time scale and high-resolution correlation of Silurian events. In addition, some ISSS members are focusing on generation of new, high-resolution radiometric dates that are well constrained within the Silurian time scale. This is essential to achieve better calibration of this scale, which is has been a serious weakness for the Silurian System.

9. BUDGET AND ICS COMPONENT FOR 2013

Contribution toward transportation, accommodation & registration of the Chair and Vice-Chair, to participate in the field meeting of the the ISSS

\$4000.00

Financial support for field meetings to Silurian GSSPs, particularly for the working groups restudying the base of Aeronian and Wenlock.

\$6000.00

The ISSS has done pioneering work in the area of restudy of previously ratified GSSPs (see below). Recent work has shown that many of the Silurian GSSPs, all of which were ratified in the mid-1980s, have serious deficiencies in terms of their potential use as benchmarks for high-resolution global correlation. Two working groups are currently focusing on restudy of the base of the Aeronian Stage and the base of the Wenlock Series. Future working groups will study the other GSSPs of Silurian

System. The money carried over from 2012 will be used to help fund the boundary working group workshop at the 2013 meeting in Lund, but we will need additional boundary working group meetings in 2013-2014 to study additional sections in other parts of the world.

Total requested from ICS:

\$10,000.00

Potential funding sources outside IUGS

Most of the costs of Working Group newsletter, meetings and other activities will be met by local support from host institutions and participation by individuals by national research and travel grants from their own authorities.

10. CHIEF ACCOMPLISHMENTS OVER PAST FIVE YEARS (2008-2012)

Over the period of 2008-2012 the Subcommittee on Silurian Stratigraphy was active in several respects. The most recent of these activities are summarized above under the heading of "CHIEF ACCOMPLISHMENTS AND PRODUCTS IN 2012". In addition to those, the following are the most significant accomplishments of the past five years.

1) The restudy of the base of the Silurian System. A restudy of the GSSP for the Base of Silurian was prepared in 2002 by a working group under the leadership of Michael Melchin. After three years work, the working group has unanimously agreed that the current GSSP, at 1.6 m above the base of the Birkhill Shale, at Dob's Linn, Scotland, should be maintained as the GSSP, but the biostratigraphical definition of the boundary needs to be revised. The GSSP should be regarded as coinciding with the first appearance of *Akidograptus ascensus*, defining the base of the *A. ascensus* Biozone at that GSSP section. It has now been ratified by ICS and IUGS and a final report was published in the September, 2008 issue of Episodes.

2) Regarding the restudy of the base of the Wenlock Series, previous work was reported in previous ISSS Annual Reports and Silurian Times Newsletters. This is a matter of ongoing research and discussion for the Subcommittee, including a new PhD thesis underway by Alex Ayling, supervised by Dr. D. Loydell at University of Portsmouth, studying a promising Llandovery-Wenlock succession in Wales.

3) ISSS members participated in 19 conferences in which IGCP 503 held sessions or symposia and undertook collaboration on planning of a followup IGCP project proposal, IGCP 591.

4) The Silurian Field Meeting, called "*Time and life in the Silurian: a multidisciplinary approach*" was held between 4-11 June 2009 in Sardinia, Italy. The meeting (organized by Petr Storch, Enrico Serpagli and Annalisa Ferretti) consisted of three days of scientific communications followed by a four days field trip in southern Sardinia. More than fifty scientists from fifteen countries attended the meeting. The scientific sessions were filled with talks dealing on any aspect of Silurian stratigraphy and palaeontology; the poster session included 18 posters.

In connection with the meeting, three special volumes were published in the series of the *Rendiconti della Società Paleontologica Italiana*: A. The Silurian of Sardinia - Corradini C., Ferretti A. & Storch P. (Eds.), 170 pp., which was dedicated to Prof. Enrico Serpagli. B. Time and Life in the Silurian: a multidisciplinary approach - Field Trip Guidebook - Corradini C., Ferretti A. & Storch P. (Eds.), 96 pp. C. Time and Life in the Silurian: a multidisciplinary approach - Abstracts - Corriga M.G. & Piras S. The volume includes the forty-seven abstract of the talk or posters presented at the meeting. The pdf of the volume is available in the meeting web page (www.unica.it/silurian2009).

A proceedings volume from this conference was published in a special issue of *Bollettino of the Società Paleontologica Italiana* in 2010.

5) All three of the ISSS executive participated in the ICS Workshop “The GSSP Concept”, in Prague, May 30-June 3, 2010. The ISSS chair made a brief presentation on the current state of understanding and some of the revisions and remaining problems associated with several of the Silurian GSSPs.

6) The International Symposium on the Silurian System “Siluria Revisited” took place July 9-15, 2011, in Ludlow, England. There were two days of oral presentations focusing on a wide range of Silurian topics and many of the presentations were also contributions to IGCP 591. Of particular significance were the pre- and post meeting field trips that toured the type areas for the Llandovery Series in Wales and the Wenlock and Ludlow series in England. These trips gave the opportunity to a new generation of Silurian researchers to view the GSSPs for all of the Llandovery, Wenlock and Ludlow series and stages (except the base of the Llandovery, which is in Scotland). This meeting resulted in the publication of a program and abstracts volume, a field guide, which includes many new observations and interpretations of the localities, including the GSSPs visited. This field guide is available for download at: <http://www.igcp591.org/books.php>. In addition, a conference volume of submitted papers, to be published as a special issue of Bulletin of Geosciences, is in progress.

7) The SSS Chair continued his interaction with scientists at the British Geological Survey in the development of collaborative research between BGS scientists and members of the Silurian Subcommittee, particularly focusing on the restudy of the type areas for the GSSPs for the Silurian, all of which occur in the UK except for the base of the Pridoli. Such work is forming the basis of future refinement of the definition and correlation of the GSSP, particularly those in Wales and the Welsh borders, including the bases of Aeronian, Telychian, Wenlock (Sheinwoodian), Homerian, Ludlow (Gorstian), and Ludfordian. Each of these GSSPs can be shown to be in need of refinement or redefinition and these features were highlighted during the Siluria Revisited field trips. New research by the BGS has resulted in considerable refinement of the stratigraphic and structural framework for this region and this will form an important basis for future deliberations regarding the merits of these GSSPs and their possible need for reconsideration. As a result, a number of the BGS researchers were key participants and co-leaders of the Siluria Revisited field trips and made substantial contributions to the field guide for that trip. The results of some of the research in the type Llandovery area were recently published in: Jeremy R. Davies, Richard A. Waters, Stewart G. Molyneux, Mark Williams, Jan A. Zalasiewicz, Thijs R. A. Vandenbroucke and Jacques Verniers. 2012. A revised sedimentary and biostratigraphical architecture for the Type Llandovery area, Central Wales. Geological Magazine, Available on CJO doi:10.1017/S0016756812000337

8) As part of the ongoing efforts to resolve this problem of the GSSP for the Base of the Wenlock the ISSS voting member Dr. P. Štorch has been working with Chinese researchers on a Llandovery-Wenlock boundary section in Ziyang, China. The results of this and other recent investigations have shown that we are still lacking a strong candidate for a new GSSP for the Base of Wenlock. As noted above, new research on this problem is under way.

9) It was decided at the business meeting of the ISSS in Ludlow to strike a new stage boundary working group to restudy the base of the Aeronian Stage. This was decided after the field trip visit to the current GSSP and extensive discussion at the business meeting. Dr. P. Štorch has agreed to lead this working group.

10) Five of the ISSS Titular Members, including the Chair and Vice-Chair, were co-authors on a paper published in *Lethaia* in 2011, outlining a proposed, informal subdivision of the Silurian time scale into stage slices. The paper also presented a generalized carbon isotope curve for the Silurian as well as an updated proposed correlation of the North American regional stages with the global standard scale.

11) The ISSS Chair, with several colleagues, prepared the chapter on the Silurian System for the 2012 edition of *The Geologic Time Scale*. This chapter is now published.

12) Publication of a special volume of Proceedings of the Yorkshire Geological Society honouring the lifetime contributions of Dr. Barrie Rickards, a well known and respected Ordovician-Silurian graptolite paleontologist and stratigrapher was published in November, 2011. Invited papers focus on current research in graptolites, including contributions from Silurian graptolite researchers.

13) The ISSS is a key partner in IGCP 591 – The Early to Middle Paleozoic Revolution. The planned milestone for IGCP 591 for 2012 is “Reconstructing global sea levels, sequence stratigraphy and paleogeography”. The activities for IGCP 591 in 2012 included:

EGU General Assembly - Vienna, Austria, April 22-27, 2012

Programme Group: SSP – Stratigraphy, Sedimentology & Palaeontology
Session: SSP2.2 Palaeozoic global sea level: linking stratigraphy, bioevents, and the stable isotope record,
Convener: Dr Ž. Žigaitė, co-Conveners: D. Ray, T. Vandembroucke, B. Cramer

IGCP 591 Annual Meeting - Cincinnati, Ohio, USA, July 22-28, 2012

Organised by Cramer & Brett. Pre-conference excursion to Katian-Wenlock - Southern Appalachian Basin (KY, OH, IN); post-conference excursion to Wenlock-Lochkovian - Illinois Basin/Michigan Basin (IL, IN, MI). Special volume in *Stratigraphy* is currently in preparation (eds. Cramer & Melchin).

GSA North Central Symposium and Pander Society Meeting Dayton, Ohio, USA, April 22-24, 2012 - IGCP 591 special session will be organized by Kleffner and Bauer.

34th International Geological Congress, Brisbane, Australia, August 6-10, 2012

Symposium 3.5 in technical program, Theme 3, organized by Histon, Tewari, & Melchin. Special volume in *Palaeo3* is currently in preparation (eds. Histon, Tewari & Melchin).

OBJECTIVES AND WORK PLAN FOR NEXT 4 YEARS (2013-2016)

In addition to the points listed above as “WORK PLAN, CRITICAL MILESTONES, ANTICIPATED RESULTS AND COMMUNICATIONS TO BE ACHIEVED NEXT YEAR”, many of which will extend into future years, the priorities (not in order of merit) proposed for the Silurian Subcommittee for the next four years include:

The research objectives for IGCP Project 591 are to investigate the biological, chemical and physical evolution of the ocean-atmosphere-biosphere system during this dynamic interval of Earth history by addressing in detail the relationships between climate, sea level, tectonics, biology, oceanography, volcanism, and the stratigraphic record of Early to Middle Paleozoic global planetary change. This project is being conducted in collaboration with the International Subcommissions on Ordovician, Silurian, and Devonian Stratigraphy (SOS, SSS, SDS), and will be accomplished in successive steps over the five-year duration of the project (2011-2015).

2011 – Improving global biostratigraphic and chronostratigraphic correlation

2012 – Reconstructing global sea levels, sequence stratigraphy and paleogeography

2013 – Identifying biological, chemical and physical indicators of global planetary change

2014 – Addressing evolutionary paleoecology, paleobiodiversity and paleobiogeography

2015 – Oceanographic and climate modeling of Early to Middle Paleozoic events

Further collaborating with the British Geological Survey in the remapping and stratigraphic reinvestigation of the GSSPs and surrounding type regions for the bases of the Aeronian, Telychian, Wenlock (Sheinwoodian), Homerian, Ludlow (Gorstian), and Ludfordian.

We are working on the establishment of data-bases which would bring together and make available information from all sources associated with the Silurian researchers. One such database has been created at the Nanjing Institute of Geology and Palaeontology by Dr. Fan Junxuan, who is also Webmaster for ISSS. This database, called Geobiodiversity Database (GBDB) is currently in the advanced development stage.

Research is currently under way or planned to begin in 2013 by ISSS members, colleagues and students on base of Aeronian, Telychian and Sheinwoodian sections in UK, Czech Republic and China, as part of the process of selection of possible new GSSP sections.

ISSS Field Meeting for 2015. Location TBA.

Other related activities include participation in the production of a new volume synthesizing our current understanding of Palaeozoic Palaeobiogeography. This volume is being edited by D.A.T. Harper and T. Servais.

APPENDIX [*Names and Addresses of Current Officers and Voting Members, 2012-2016*] SUBCOMMISSION ON SILURIAN STRATIGRAPHY

Subcommission officers

Chairman: Michael J. Melchin, Department of Earth Sciences, St. Francis Xavier University, Antigonish, NS, Canada, B2G 2W5; mmelchin@stfx.ca.

Vice Chairman: Peep Mannik, Institute of Geology at Tallinn University of Technology, Ehitajate tee 5, 19086 Tallinn, Estonia; mannik@gi.ee.

Secretary: Renbin Zhan, Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, Nanjing 210008, China, rbzhan@nigpas.ac.cn

List of Voting Members in 2012

A. I. Antoshkina, Syktyvkar, Russia,	antoshkina@geo.komisc.ru
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Zhan Renbin, Nanjing, China,	rbzhan@nigpas.ac.cn

Second circular

International Geoscience Programme Project 591 3rd Annual Meeting

jointly with

International Subcommittee on Cambrian Stratigraphy
(ISCS)

International Subcommittee on Ordovician
Stratigraphy (ISOS)

International Subcommittee on Silurian Stratigraphy
(ISSS)

9-19 June 2013, Lund, Sweden

Sponsored by the Department of Geology, Lund University, Geological Survey of Sweden, the Geological Society of Sweden, and the Swedish Research Council





General information

The third annual meeting of IGCP 591 will be hosted by the Department of Geology at Lund University, southernmost Sweden. The meeting is co-arranged with the subcommissions on Cambrian Ordovician and Silurian Stratigraphy and will form an excellent platform for scientific discussions across the systems boundaries. The formal theme of the meeting will be ***'Early Palaeozoic Global Change'***. Scientific sessions in Lund will be followed by a regional field trip to visit Lower Palaeozoic sections in Skåne and Västergötland provinces, southern Sweden, as well as in the Oslo area of southern Norway. The localities to be visited include well-exposed Cambrian sandstone and alum shale formations, the basal Floian and Sandbian GSSP's in the Ordovician, the classical Orthoceratite Limestone of Baltoscandia as well as important Ordovician-Silurian boundary sections and most of the Silurian succession (Appendix 1). Information about the city of Lund is found in Appendix 2.

Organization and scientific committee

Mikael Calner (chairman), Department of Geology, Lund University
Oliver Lehnert (vice-chair), GeoZentrum Nordbayern, Erlangen University
Mike Melchin (ISSS), St. Francis Xavier University, Nova Scotia
Loren Babcock (ISCS), University of Columbus, Ohio
David A.T. Harper (ISOS), Van Mildert College
Per Ahlberg, Department of Geology, Lund University
Jan Audun Rasmussen, Copenhagen University
Hans Arne Nakrem, National Museum of Norway
Mikael Erlström, Swedish Geological Survey, Lund
Peter Dahlqvist, Swedish Geological Survey, Lund
Hanna Calner, Lund University
Anders Lindskog, Lund University
Kristina Mehlqvist, Lund University

Schedule

Sunday 9 June 2013 – Registration starts at 15:00 at the Department of Geology, Lund University where also the ice-breaker takes place between 18:00-21:00. At this time you also have the possibility to mount your poster or last minute upload your talk.

10-12 June – Scientific sessions, and poster exhibitions between 09:00 and 17:00 at the Department of Geology, Lund University (posters displayed throughout the meeting).

12 June (15:00-18:00) – Group meetings IGCP/ISCS/ISOS/ISSS

12 June – Conference dinner (location will be announced in the third circular)

13-14 June – Post-Conference excursion to the Cambrian, Ordovician and Silurian of Skåne, leaving for Västergötland in afternoon on the 14th. Check-out from your hotel in Lund on the morning of the 14th. Check-in for two nights at the Falkängen youth hostel at famous Kinnekulle the same evening (<http://falkangen.se/>).

Post-conference excursion (detailed in appendix 1)

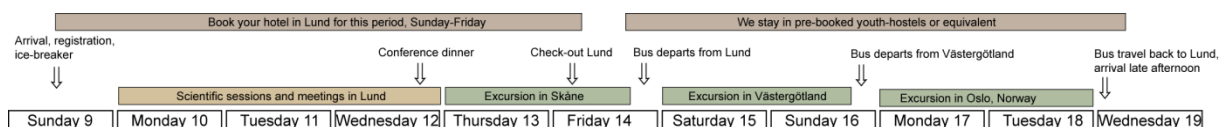
Note that the post-conference excursion is limited to 60 persons. We already have, from the first circular, a provisional list of more than 60 participants ordered according to the date of their response. We are very happy about this interest! If you are interested in the field trip but not have signed up, please send an e-mail to Per.Ahlberg@geol.lu.se. You will then be placed on our 'waiting list'. The deadline to transfer the costs of the trip, together with the registration fee, is March 29th, 2013.

15-16 June – Field excursion to the classical 'table mountains' of Västergötland where a thin veneer of Cambrian, Ordovician and basal Silurian strata are preserved beneath Permian dolerite sills. Leaving for Norway in afternoon on 16th. We arrive to the Oslo area in the late evening to check-in at Strandheim leirsted near Naersnäs at the shore of the Oslo fjord.

17-18 June – Field excursion to the Lower Palaeozoic of the Oslo district (Asker area and north of Oslo). Overnight at Strandheim leirsted.

Wednesday 19 June – optional: Departure from Gardemoen Airport in Oslo [if you care for your own transportation to the airport] or travel to Lund by bus (arrival late afternoon) for those who wish to departure from Copenhagen.

Please note that spouse activities are only arranged for 10-12 June (see below).



Registration fee and payment

The registration fee for the scientific sessions at Lund University is **US\$ 200.-** (for senior researchers as well as PhD students) and covers the formal registration, the abstract proceedings, printed field guidebook, handouts, icebreaker snacks and drinks, conference dinner, and all coffee breaks.

The fee for the post-Conference excursion (limited to 60 participants) in southern Sweden and Norway is **US\$ 1,000.-** for senior researchers (**US\$ 700.-** for PhD-students) and includes bus travel through southernmost Sweden and Norway, road tolls (Norway) and costs from June 14-19, including accommodation in youth hostels and meals.

You pay for the conference and post-conference excursion by Visa/Master card by following this link <https://ssl.webbhotell ldc.lu.se/luccp/default.aspx?LanguageToChangeTo=en> Make sure to choose

'IGCP 591 Annual Meeting Lund' under the 'Event' scrollbar. Also note that the website for payment service will close on May 1st 2013. After this date you will not be able to pay for the conference. It is possible for researchers with limited funding to apply for some support. Please contact Mikael Calner in good time if this is needed.

Submission of abstracts and short papers

Abstract submission

Submit your abstract in Word-format (.doc) on <http://www.geol.lu.se/Events/upload/> no later than **March 29 2013**. The file should be named after the first author's surname followed by underscore and 'oral' or 'poster' (e.g. Ahlberg_poster.doc). The abstract should be written according to the editorial style of the Swedish geoscientific journal GFF (see below) and should include a maximum of 750 words, including references. One high-resolution, grey-scale line drawing or high-contrast black-and-white photograph can be included. The abstracts will be published as a meeting proceeding in GFF Vol. 135 (2) (2013) (Ed. Lindskog & Mehlqvist). The proof of this proceeding will be distributed during the meeting. **All questions regarding conference abstracts should be directed to Anders Lindskog (anders.lindskog@geol.lu.se).**

Thematic short paper to GFF

You have the possibility to submit a short manuscript to the IGCP 591 proceedings volume that will be published in the Swedish scientific journal GFF Vol. 135 (4, December issue). The volume will be edited by Calner, Lehnert, Albanesi, Babcock, Harper & Melchin and we will to some extent utilize friendly reviews by conference participants in order to speed up the publication of this volume. Because of the great interest in submitting a manuscript for the thematic issue, as indicated by the first circular, manuscripts will be published as *GFF Notes*, meaning a maximum of 4 printed pages including figures and references. Manuscripts are uploaded via the Taylor & Francis website, where you also find instructions on editorial style and information about size and resolution of figures <http://www.tandfonline.com/action/authorSubmission?journalCode=sgff20&page=instructions>. When you upload, make sure to assign your manuscript to the thematic issue 'Early Palaeozoic Global Change' (Eds. Calner et al). Deadline for submission of manuscripts is **June 5 2013**.

Oral and poster presentations

Oral presentations are limited to 12 minutes plus 3 minutes for questions. PowerPoint presentations (ppt, pptx or pdf format) will be shown on 3X3 m screen with high definition laser canon. Upload and submit your presentation at <http://www.geol.lu.se/Events/upload/> no later than **June 5** (only administrators thereafter have access to the file). The upper size limit for your presentation is 100 Mb and we prefer .pdf-format for size reasons. As a second, and less attractive, alternative you can deliver your presentation on a memory stick at the registration on Sunday 9th June. Please avoid this as far as possible.

Posters will be displayed throughout the entire meeting immediately next to the scientific sessions lecture hall. Size of posters should be A0.

Travel to Lund

The Copenhagen Airport (Kastrup) in Denmark is one of the large international airports in northern Europe. Trains across the bridge to Sweden and Lund depart from the airport every 20 minutes (takes ca 45 minutes to Lund Central Station (Lund C; <http://goo.gl/maps/2fecm>) and participants will be required to arrange this travel on their own. One way ticket costs 135 SEK (about 20 US\$)

Hotels (pre-booked)

Very important! You must book your accommodation yourself. For your convenience we have pre-booked a selection of rooms in different hotels and different price categories in Lund, but of course there are several other hotels that you can choose to book (<http://goo.gl/maps/2fecm>). Please note the individual deadlines for booking of a room in the hotels we pre-booked (specific for each hotel). After these dates the pre-booked rooms are cancelled and you may need to find a room by yourself. Also note that prices are based on the year 2012 and may have changed slightly in 2013. Also give reference to the specific *reservation code* when you book in order to get these lower rate prices (Lund University agreement). Call or e-mail in your reservation. **All questions about accommodation should be directed to Kristina Mehlqvist (Kristina.Mehlqvist@geol.lu.se)**

Hotel Lundia <http://www.lundia.se/?sid=211>

Phone +46 (0) 46 280 65 00, e-mail: reservations@grandlundia.se, distance from the Geology Department: 1,100 m. Distance from downtown Lund: 0 m.

20 single rooms booked. 1,369 SEK per room per night (about 205 US\$, including breakfast buffet).

5 double rooms booked. 1,842 SEK per room per night (about 275 US\$, including breakfast buffet).

Reservation deadline April 8 2013. Reservation code: 60953

Hotel Djingis Khan <http://www.djingiskhan.se/doc/econtact.php>

Phone +46 (0) 46 33 36 00, e-mail: info@djingiskhan.se, distance from the Geology Department: 1,500 m. Distance from downtown Lund: 1,400 m.

24 single rooms booked. 1,000 SEK per room per night (about 150 US\$, including breakfast buffet, coffee/tee, smaller evening meal, free relax section)

10 double rooms with separate beds booked. 1,100 SEK per room per night (about 165 US\$, including breakfast buffet, coffee/tee, smaller evening meal, free relax section)

Reservation deadline 120501. Reservation code: G 77583

Clarion Hotel Planetstaden <http://www.planetstaden.se/>

Phone +46 (0)46-280 01 00, e-mail: hotel@planetstaden.se, distance from the Geology Department: 1,700 m. Distance from downtown Lund: 700 m.

15 single rooms booked. 1,245 SEK per room per night (about 185 US\$, including breakfast buffet and a smaller evening buffet)

5 double rooms booked. 1,660 SEK per room per night (about 240 US\$, including breakfast buffet and a smaller evening buffet)

Reservation deadline 120501. Reservation code: 'IGCP 591'

Hotel Duxiana <http://www.lund.hotelduxiana.com/?s=inenglish&lang=eng>

Phone + 46 (0) 46-13 55 15, e-mail: info@lund.hotelduxiana.com

Distance from the Geology Department: 800 m. Distance from downtown Lund: 0 m.

5 Grand Lit single rooms booked. 1,200 SEK per room per night (about 180 US\$, including breakfast buffet)

5 Twinsize room booked. 1,400 SEK per room per night (about 210 US\$, including breakfast buffet)

Reservation deadline 120501. Reservation code: 'IGCP 591, booking nr. 026205'

Patienthotellet

<http://www.skane.se/sv/Webbplatser/SUS/Skanes-universitetssjukhus-Lund/Vard/Verksamheter/Boende/Anhorighotellet/>

Please note that these rooms should primarily be provided to PhD students or colleagues with limited funding.

Phone + 46 (0) 46-17 86 00, Distance from the Geology Department: 1,000 m. Distance from downtown Lund: 1,000 m.

Low-price-alternative in hotel associated to the University hospital in Lund.

10 single rooms booked. 519 SEK per room per night (about 78 US\$). No breakfast included! Toilet and shower in room and cooking facilities in the corridor.

Reservation deadline 120501. Reservation code: 'Mikael Calner'

Ice-breaker and registration

The registration and ice-breaker takes place in the main entrance of the Geology Department on Sunday from 15:00 (ice-breaker at the same location between 18:00-21:00). At this time you can register, pick up your badge and conference package (including abstract collection and printed field guide), mount your poster, or upload your PowerPoint presentation. Take the opportunity to stay and chat with colleagues. Beverages and snacks will be served. The registration desk will be open also on Monday-Wednesday 08:30-10:00.

Conference dinner

The conference dinner will take place on June 12th and the location will be announced in the third circular.

Spouse activities

Spouse activities will only be arranged for during the time period of the scientific sessions in Lund. The spouse activities will be detailed in the third and final **circular** around May 1st 2013.

Contact information for the IGCP 591 annual meeting 2013

General questions about the meeting, scientific sessions or related to IGCP 591 should be directed to the Meeting Chair Mikael Calner, mikael.calner@geol.lu.se, <http://www.geol.lu.se/persinfo/detailsv.php?uid=15>

Questions related to ISCS activities – Loren Babcock, Loren.Babcock@geol.lu.se

Questions related to ISOS activities – David A.T. Harper, david.harper@durham.ac.uk

Questions related to ISSS activities – Mike Melchin, mmelchin@stfx.ca

Payment: Michaela Rydahl, economist, Department of Geology, Lund University, michaela.rydahl@cgbkansli.lu.se

Post-conference excursion: Per Ahlberg, per.ahlberg@geol.lu.se If your question concerns specific localities or accommodation in the Oslo district, please contact Hans Arne Nakrem, e-mail: h.a.nakrem@nhm.uio.no

Welcome to Lund in June 2013!

On behalf of the organizing committee,

Mikael Calner and Oliver Lehnert

Please check the IGCP 591 website for information of the project and updates

<http://igcp591.org/>

Important dates:

Request for Support: **March 1st, 2013**

Registration Payment: **March 29th, 2013**

Abstract Submission: **March 29th, 2013**

Article Submission: **June 5th 2013**

Upload talk: **June 5th 2013**

Appendix 1: Post-Conference Excursion Route

All questions about the post-conference excursion should be directed to Per Ahlberg (Per.Ahlberg@geol.lu.se)

Skåne Province

Thursday June 13th 2013

Stop 1: Lower-Middle Cambrian coastal exposures south of Brantevik Harbour

Quartz arenites and quartzites of the Hardeberga Formation with Skolithos ichnofacies and abundant wave- and current induced sedimentary structures depicting deposition in shoreface environments. Phosphorite-rich sandstone and limestone.

Stop 2: Middle Ordovician of the Killeröd Quarry

Small abandoned quarry with Darriwilian 'orthoceratite limestone'. Sampling possible.

Stop 3: Middle and Upper Cambrian at Andrarum

Abandoned quarry with Series 3 and Furongian Alum Shale Formation with stinkstones (orsten).

Stop 4: Upper Silurian at the Bjärsjölagård Quarry

Small abandoned quarry with exposures of the Late Ludlow Bjärsjölagård Limestone Member of the Klinta Formation (Öved-Ramsåsa Group). Argillaceous limestone and calcareous mudstone that is partly very fossiliferous and rich in oncoids (late part of the Lau Event).

Friday June 14th 2013

Stop 5: Upper Silurian at Rövarekulan

Natural outcrop exposing parts of the thick Colonus Shale (calcareous shale and siltstone).

Stop 6: Middle and Upper Ordovician at Fågelsångsdalen, including the base Sandbian GSSP

Natural outcrops exposing a shale succession and the Fågelsång Phosphorite Bed. This is the Global Stratotype Section and Point for the base of the Upper Ordovician Sandbian Stage, based on the FAD of Nemagraptus gracilis.

Stop 7: Lower Cambrian at Skrylle Quarry

Large active quarry with quartzites of the Hardeberga Formation and lower portions Laesaå Formation. Thick Permian dolerites cut through the succession.

Västergötland Province

Saturday June 15th 2013

Stop 7: Pre-Cambrian-Cambrian transition at Råbäckshamn

The contact between the Precambrian gneiss and the oldest Cambrian strata; the basal Cambrian conglomerate (visible at favorable water level) and Mickwitzia Sandstone.

Stop 8: Middle and Upper Cambrian at Kakeled Quarry

Alum Shale Formation (Series 3 and Furongian) including the 'Great Stinkstone Bed' (Kakeled Bed).

Culture stop: Husaby kyrka

The oldest stone church Olof Skötkonung, the first Christian king of Sweden, is rumoured to have allowed himself to be baptised at a well by the church in 1008.

Stop 9: Lower and Middle Ordovician at Hällekis Quarry

Large abandoned quarry exhibiting an instructive succession through Dapingian-Darriwilian cool-water/temperate carbonates deposited in a starved basin ('orthoceratite limestone'). Great exposure of the Lanna and Holen limestones (including the famous 'Täljsten' interval), and the Gullhögen and basal Ryd formations.

Stop 10: Middle Ordovician at Österplana Quarry

Small, active quarry with Middle Ordovician (Darriwilian) temperate carbonates ('orthoceratite limestone') formed in a starved intracratonic basin; famous for the findings of numerous fossil meteorites in the Holen Limestone. Exceptional chance to see the 'orthoceratite limestone' in cut surfaces.

Stop 11: Thorsbergs Stenhuggeri

Manufacturing of carbonate-rock floor tiles, etc., a classic element in Swedish architecture.

Evening (19:00) Dinner at the restaurant at the top of Mt. Kinnekulle and visit of a small Silurian (Llandovery) shale outcrop next to the restaurant.

Sunday June 16th 2013

Stop 12: Upper Ordovician and lowermost Silurian at Skultorp Quarry, Skövde

Abandoned quarry exposing Upper Ordovician (Katian and Hirnantian) mud- and siltstones, oolitic limestone (Hirnantian), and lowermost Silurian shale (Kallholn Formation).

Stop 13: Upper Cambrian through Middle Ordovician at Tomten Quarry, Falköping

Large abandoned quarry exposing Cambrian-Ordovician strata. A paleokarst surface records substantial hiatuses between the Alum Shale Formation a Tremadocian glauconite bed and the 'orthoceratite limestone'.

Stop 14: Lower Ordovician at Flo, Hunneberg, including the base Floian GSSP

Lower Ordovician bituminous shale and limestone. This is the Global Stratotype Section and Point for the base of the Floian Stage, defined by the FAD of Tetragraptus approximatus.

Norway

Monday June 17th 2013, Oslo-Asker District

Stop 15: Sub-Cambrian peneplain, road cut at Slemmestad Torg

Middle Cambrian Alum Shale overlying weathered Precambrian, metamorphic basement.

Stop 16: Cambrian-Ordovician boundary, Nærsmæs beach section

Alum shale with stinkstone concretions.

Stop 17: Tremadoc to Darriwilian units, Djuptrekkodden and Bjørkåsholmen, Slemmestad

The two neighboring peninsulas exhibit an instructive Lower and Middle succession through the upper Alum Shale, Bjørkåsholmen, Tøyen, Huk and basal Elnes formations.

The localities are preserved.

Driving along E-16 (no stop). *Lunch between Slemmestad and Tyrifjorden.*

The red-colored and fluvial deposited Ringerike Group represents the latest basin fill of Lower Paleozoic age in the Oslo Region.

Stop 18: Tyrifjorden, Ringerike, Svartøyene (boat transportation)

Svartøya Formation. Hirnantian. Late Ordovician transition from inner shelf mudstones to shoreline sandstones to a carbonate platform with well-developed reef deposits. Oil-stained limestones.

Stop 19: Tyrifjorden, Ringerike, Rytteråker (boat transportation)

Early Silurian siliciclastic shelf deposits passing upwards into carbonate platform with shoal and bioherm facies. Red colored shelf deposits, the Vik Formation. Coral-stromatoporoid buildups overlying carbonate shoals.

Stop 20: East side of Steinsfjorden, Tyrifjorden

The latest basin fill of the Lower Paleozoic Oslo Region. Late Silurian fluvial sandstone.

Tuesday June 18th 2013

Stop 21: Upper Ordovician Arnestad Formation with Kinnekulle K-bentonite

Middle Ordovician nodular limestone and shale (Arnestad Formation) interbedded by volcanic tufa/bentonite.

Stop 22: Beach sections on Nakkholmen (island in the Oslo Fiord; transportation by public boats)

Arnestad, Frognerkilen, Nakkholmen, Solvang, Venstøp, Grimsøya, Skjerholmen, Skogerholmen, Husbergøya and Langøyene formations (Upper Ordovician).

Lunch in the field.

Stop 23: Beach sections on Hovedøya (island in the Oslo Fiord; transportation by public boats)

The Upper Ordovician Langøyene Formation is overlain by the Silurian Solvik Formation.

Appendix 2: About Lund, transportations and other information

Lund is one of Sweden's oldest cities and belonged to Denmark until 1658 when it finally became Swedish. The city was founded around year 990 A.D. In the year 1425 the *Studium Generale* was started in Lund as the first University in Denmark and the Nordic countries. After Lund became Swedish, Lund University was founded in 1666. Below, we have compiled some information about famous sights to visit in Lund.

Kulturen

Kulturen is Skåne's largest museum and the second oldest open-air museum in the world; here you can see how people have lived in Sweden throughout history. There are also several other exhibitions, like arts and crafts from all over the world. For more information, see: <http://www.kulturen.com/besoksinformation/welcome/>

Domkyrkan

The large Cathedral in Lund goes back to 1145 and has several artifacts and features of historic value. The cathedral has over 700 000 visitors every year. There is also a museum where the history of the cathedral is shown for example and there is also possible to go on a guided tour. For more info, see: <http://www.lundsdomkyrka.se/english/>

Botanical garden

The botanical garden in Lund hosts over 7000 different plant species. Here you can enjoy the beautiful garden and the greenhouses, which hold a variety of plants from all over the world. The garden also has a café and a store. For more information, see: <http://www.botaniskaträdgården.se/in-english.html>

Lund University Historical museum

The historical museum in Lund was founded in 1805 and is Sweden's second largest archeological museum. Here you can see several different exhibitions. For more information, see: <http://www.luhm.lu.se/>

Uppåkra

A famous excavation site called Uppåkra lies just 5 km from Lund. Uppåkra hosted a settlement that dates back to the Swedish Iron Age and was burned down around the end of year 900 A.D.

Archaeological work is still in progress, and guided tours are arranged on a regular basis throughout the summer months.

Further information

At the tourist information bureau you can get more information on sightseeing in Lund, Skåne and Denmark. The tourist information is situated in central Lund at Stortorget.

Seeing Lund and its surroundings

Lund is situated in a busy region of the province of Scania (Skåne). The town is close to other larger cities, such as Malmö, Helsingborg and Copenhagen (Denmark), and travelling between the cities is both easy and relatively quick. All places of course have their own charm and opportunities for sightseeing and shopping are abound. Travel by train from Lund to Copenhagen is via the magnificent Øresund Bridge. Ferries from Helsingborg to Helsingør (with the Hamlet Castle), Denmark, departure every 20 minutes and is an attractive option.

At the Department of Geology, we will keep information on tourism and travel available. Brochures and other informative material are available.

Getting around town and the vicinity

The central part of Lund is within walking distance from the Department of Geology, where the IGCP scientific sessions are held. Travel to Malmö and Copenhagen is possible either with bus or train, and timetables are available at stations, as well as on the Internet and in apps for smartphones. Travel to Copenhagen is easiest by train from Lund or Malmö. Travel between cities/towns by train is generally recommended choice, as it is speedy and takes you to relatively central places in all the mentioned cities (also, the multitude of bus lines may be an unnecessary source of confusion – even for us Swedes). Of course, the railroad system also lets you travel to other interesting places around the province (and further).

Travel within and between cities/towns is possible by bus. The within-city buses are green and the between-city buses are yellow. The public transports operating within cities are 'cash free', and tickets are payed for either through a cell-phone SMS service, or purchase of a discount travel card. These so-called Jojo cards are available at Skånetrafiken (the regional public transport company) information centers and select partners (e.g., Coop, Pressbyrån). The Jojo cards contain a select amount of pre-payd travel money (minimum 200 SEK) which may be used for both bus and train travel (and can be refilled with funds at service centers if needed). These cards may also be used when travelling to Copenhagen. More information about ticket prices and payment options is available here:

<http://www.skanetrafiken.se/templates/StartPage.aspx?id=16125&epslanguage=EN>

On yellow (intercity) buses and at railroad stations, you can pay your ticket with either a Jojo card or credit/debit card (but Jojo cards provide discount on ticket prices). When travelling by train you must pay for your ticket in one of the ticket machines at the train station, as it is not possible to buy tickets onboard the trains.

Notable sights in Malmö

‘Västra hamnen’ and Turning torso; beach resort-style buildings, interesting architecture and boardwalk by the sea

(<http://translate.google.com/translate?hl=en&tl=en&sl=sv&u=http%3A//www.malmo.se/Medborgare/Stadsplanering--trafik/Stadsplanering--visioner/Utbyggnadsomraden/Vastra-Hamnen.html>)

Malmö museums (<http://www.malmo.se/Medborgare/Kultur--noje/Museer--utställningar/Malmo-Museer/Sprak/In-English.html>, combined entrance fee); Malmöhus castle, museum of technology

Slottsträdgården; the old castle gardens and park

(<http://www.malmotown.com/en/list/culture/attractions/slottstradgarden>)

The old parts of town encircled by the canal, the nice cobblestone square ‘Lilla Torg’

(<http://www.malmotown.com/en/list/culture/attractions/lilla-torg>)

Copenhagen (<http://www.visitcopenhagen.com/>)

Nyhavn; old-time port area (www.nyhavn.com)

Strøget; famous shopping street (the world’s longest shopping street, <http://www.visitcopenhagen.com/Shopping/Stroget/382>)

Christania; freetown within the city (<http://www.christaniaooo.dk/>)

Tivoli; theme park located in central Copenhagen (www.tivoli.dk)

Lousiana Museum of Modern art - changing world class art exhibitions (www.louisiana.dk)

Other

Falsterbo/Skanör; sandy beaches

Natur- och kulturbussen; bus tours providing experiences in culture and nature

<http://www.naturochkulturbussen.se/in-english/>

Information about Lund and other places of interest

To see some more information about Lund and its vicinity, please visit the following websites:

<http://www.lund.se/en/>

<http://www.malmotown.com/en>

<http://www.visitcopenhagen.com/>

<http://www.helsingborg.se/Medborgare/toppmeny/english/>

<http://www.helsingborg-helsingor.com/english/>

<http://skane.com/en/frontpage>

Other useful information

Emergency number: 112

Skånetrafiken travel information: +46 (0)771 77 77 77



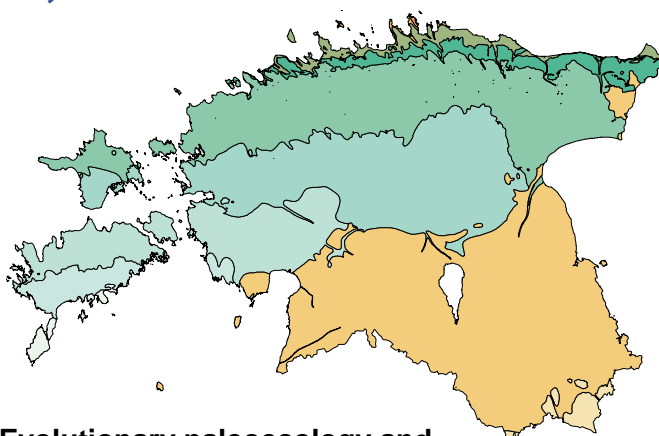
IGCP 591: *Early to Middle Paleozoic Revolution*

4th Annual Meeting

June 10–19, 2014, Estonia

First Circular

The 4th Annual Meeting of IGCP 591 will be hosted in Estonia, between June 10-19, 2014. The scientific sessions in Tartu will be preceded and followed by two geological excursions to study the lower Paleozoic carbonate succession of Estonia.



The 2014 annual theme of IGCP 591 targets **Evolutionary paleoecology and paleobiogeography**, however, the annual meeting will not be limited to these topics. A broad range of contributions on Early to Mid Paleozoic geology are expected, from paleontology and stratigraphy to geochemistry, paleogeography and climate modeling.

The meeting will be organized jointly by the Department of Geology, University of Tartu and Institute of Geology, Tallinn University of Technology, with the support from the Geological Society of Estonia and IGCP 591.

Welcome to Estonia in 2014!

Tõnu Meidla and Olle Hints
on behalf of the organizers

Schedule

November 1, 2013	Distribution of Second Circular
March 1, 2014	Deadline for registration, abstracts, and payments
June 9, 2014	Arrival to Tallinn (for pre-conference excursion)
June 10-12, 2014	Pre-conference excursion (Ordovician and Silurian of northern and central Estonia, ending in Tartu)
June 12, 2014	Registration and Ice Breaker in Tartu
June 13-15, 2014	Scientific sessions in Tartu
June 14, 2014	Conference Dinner
June 16-19, 2014	Post-conference excursion (Silurian of central and western Estonia and Saaremaa Island, ending in Tallinn)

Venue

The conference will be held in Tartu, the historical university town of Estonia, located 180 km south of the capital Tallinn. Premises of the University of Tartu will be used to house the scientific sessions and other events during the meeting. For more information about Tartu and the university see <http://www.tartu.ee> and <http://www.ut.ee>.

Excursions

Two excursions are planned to show the Ordovician and Silurian sections in mainland Estonia and Saaremaa Island. The excursions will visit a number of well-known outcrops, in addition to several new quarries that have never been visited by previous geological excursions. Should there be wider interest for looking drill cores, a short workshop can be organized in order to introduce the subsurface geology of Estonia. Please let the organizers know in advance.

Pre-conference excursion: Ordovician (June 10-12, 2014)

The 3-days excursion will start from Tallinn and focus on the Ordovician succession of northern and central Estonia. The stops to be visited include: **Pakri Cliff** (Lower Cambrian to Middle Ordovician, condensed siliciclastic to carbonate succession), **Vasalemma Quarry** (lower Katian reefs and associated facies), **Ristna/Põõsaspea** coastal outcrops (Sandbian limestones and bentonites), **Peetri outcrop** (Sandbian limestones), **Kunda-Aru Quarry** (Darrivilian limestones), **Aluvere Quarry** (Sandbian limestones), **Ambuse Quarry** (mid Katian limestones), **kukersite oil-shale outcrops** (basal upper Ordovician kerogene-rich limestones, the exact locality to be chosen), **Porkuni Quarry** (Hirnantian shallow-water limestones), **Kalana/Otisaare Quarry** (Llandovery limestones with diverse thallophytic algae). The excursion will end in Tartu, where the scientific sessions will be held. The estimated cost is EUR 250 (includes field lunches and one night accommodation in NE Estonia) and maximum number of participants is limited to 60.



The two excursions will focus on the Ordovician-Silurian carbonate succession from the Dapingian (right: Pakri Cliff, NW Estonia, pre-conference excursion) to the Pridoli (left: Ohesaare Cliff, Saaremaa Island, post-conference excursion).

Post-conference excursion: Silurian (June 16-19, 2014)

The excursion will show Silurian shallow shelf carbonate succession of central and western Estonia, including the island of Saaremaa, starting from basal Llandovery to topmost Pridoli. The stops to be visited include **Eivere Quarry** (Llandovery), **Mündi Quarry** (Llandovery), **Päri outcrop** (Llandovery), **Taali quarry** (Middle Devonian), **Üügu Cliff** (Wenlock), **Panga Cliff** (Wenlock), **Abula Cliff** (Wenlock), **Suuriku and/or Undva cliffs** (Wenlock), **Soeginina cliff** (Ludlow), **Kaarma Quarry** (Ludlow), **Kaugatuma** and **Ohesaare** cliffs (Pridoli), as well as a few sightseeing stops (Kaali meteorite craters, Kuressaare Castle, Koguva historical village). The excursion starts in Tartu and ends in Tallinn. The estimated cost is EUR 500 (includes accommodation and field lunches); the maximum number of participants is limited to 30.

Travel and accommodation

About Estonia

Estonia is located in northern Europe, between Russia, Latvia, Finland and Sweden. With an area of 45,000 km² and a population of ca 1.3 million, it is one of the smallest countries in Europe. The capital of Estonia is Tallinn, famous for its medieval old town. Tartu, the second largest city in the country, is best known for its university, established in 1632. Since 2004, Estonia is a member of the European Union and Schengen area. Should you need a visa to enter the EU, please contact the organizers for official invitation in due time. The local currency in Estonia is the Euro (EUR). See <http://www.visitestonia.com> for more information about Estonia.

Reaching Tallinn

Tallinn can be reached from many European cities by direct flights or via large international airports nearby (Helsinki, Copenhagen, Stockholm).

Reaching Tartu

Tartu can be reached from Tallinn by bus or train (ca 200 km); flight connections are limited at present. The easiest option to get Tartu would be a bus leaving from Tallinn airport every hour (the tickets should be purchased in advance; see <http://www.sebe.ee/en>). The pre-conference excursions will end up in Tartu as well.

Accommodation

Various options are available in Tallinn and Tartu, with budget accommodation starting from ca EUR 30 per night. Reasonable hotels can be found for EUR 60-80 per night. Participants will be responsible for making their own reservations. Check <http://booking.com> or similar portals. Some hotels will be prebooked and additional suggestions provided in the Second Circular later in 2013.

Estimated costs and payment options

	Senior researchers	PhD students
Conference fee covers formal registration, abstract volume, coffee-breaks	EUR 150	EUR 100
Pre-conference excursion Ordovician, includes one night accommodation and field lunches	EUR 250	EUR 250
Post-conference excursion Silurian, includes accommodation and field lunches	EUR 500	EUR 500

Please note that as of now the fees are approximate. The fees will be fixed and payments using credit card or bank transfer will be accepted starting from late 2013. The details will be provided in the Second Circular and on the conference website: <http://iqcp591.org/2014>.

Limited support from the IGCP 591 will be possible, details to be announced.

Publications

Abstracts

The abstract volume will be distributed at the conference. The length of abstracts is limited to one A4 page (single-spaced, 12 pt serif font, 2.5 cm margins), illustrations cannot be accepted. The text should be written in correct English and submitted by e-mail to igcp591.2014@gmail.com. The Scientific Committee will review the abstracts reserving the right to accept or refuse any submission. Please note that your paper can be included in the programme only if your conference fee is paid in due time. The deadline is **March 1, 2014**.

Thematic issue of *Estonian Journal of Earth Sciences*

A thematic conference volume will be published in early 2015 as an issue of *Estonian Journal of Earth Sciences*, guest edited by IGCP 591 project leaders. All manuscripts for the thematic volume will be subject to regular peer-review and need to follow the journal's style. Further instructions will be provided in the Second Circular. *EJES* is an international geosciences journal with current Impact Factor of 1.3 and indexing in ISI and Scopus. Being an OpenAccess journal, all papers become freely accessible on-line and can be distributed by the authors with no restrictions. See <http://eap.ee/earthsciences> for more information about the journal. The deadline for manuscripts is **June 1, 2014**.

Organizers

The conference will be organized jointly by the Department of Geology of the University of Tartu, Institute of Geology at Tallinn University of Technology, the Geological Survey of Estonia and the Geological Society of Estonia.

- Leho Ainsaar (Department of Geology of the University of Tartu)
- Heikki Bauert (Institute of Geology at Tallinn University of Technology)
- Olle Hints (Institute of Geology at Tallinn University of Technology)
- Peep Männik (Institute of Geology at Tallinn University of Technology)
- Tõnu Meidla (Department of Geology of the University of Tartu)
- Anne Põldvere (Geological Survey of Estonia, Geological Society of Estonia)

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TALLINN UNIVERSITY OF TECHNOLOGY



Eesti Geoloogiakeskus
Geological Survey of Estonia

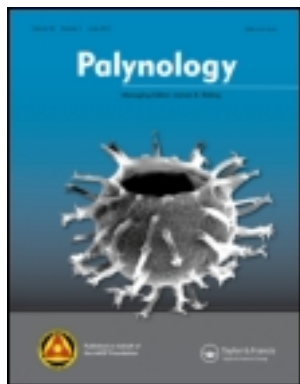


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Publisher: Taylor & Francis

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Palynology

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/tpal20>

The John Williams Index of Palaeopalynology

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Accepted author version posted online: 13 Apr 2012. Version of record first published: 28 Jun 2012.

To cite this article: James B. Riding, Matthew J. Pound, Thomas C.B. Hill, Stephen Stukins & Susanne Feist-Burkhardt (2012): The John Williams Index of Palaeopalynology, *Palynology*, 36:2, 224-233

To link to this article: <http://dx.doi.org/10.1080/01916122.2012.682512>

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The John Williams Index of Palaeopalynology

James B. Riding^{a*}, Matthew J. Pound^b, Thomas C.B. Hill^c, Stephen Stukins^c and Susanne Feist-Burkhardt^d

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The John Williams Index of Palaeopalynology (JWIP) is the result of the lifetime's work of Dr John E. Williams. Housed at the Department of Palaeontology of The Natural History Museum (NHM) in London, the JWIP is publicly available and provides probably the most comprehensive fully cross-referenced catalogue on palaeopalynology in the world. It has 23,350 references to fossil palynomorph genera or species as of February 2012. Since its inception in 1971, every publication in the collection referring to a fossil palynomorph genus or species has been critiqued by John E. Williams. Each item is given an accession number and appropriately referenced within the JWIP using index cards which are sorted alphabetically. Once added to the main reference subindex, further entries are completed for four themed subindexes. The first three of these are sets of cards on the three major palynomorph groups (acritarchs/dinoflagellate cysts, chitinozoa and pollen/spores), 26 stratigraphical intervals and 17 geographical areas. The fourth themed subindex is where each palynomorph taxon has a card (or cards) listing all the records of that species in the literature within six categories (acritarchs, dinoflagellate cysts, chitinozoa, fungal spores, pollen/spores and miscellaneous). Due to the sustained and meticulous recording of data since 1971, users can therefore search the database by major palynomorph group, species, age and/or geographical region. The comprehensive and cross-referenced nature of the JWIP means that researchers can readily identify key publications on, for example, specific palynomorph types over a particular interval in a prescribed area. The JWIP is currently entirely analogue, but the NHM is currently evaluating potential strategies for digitisation.

Keywords: card indexes; databases; literature; palaeopalynology

1. Introduction

John E. Williams worked for British Petroleum (BP) between 1968 and 1991, and began to amass a comprehensive personal literature collection with associated card indexes on palaeopalynology. This database, known as the John Williams Index of Palaeopalynology (JWIP), was constructed in order to help with palynomorph identifications during routine microscopy, and to compile key information for use in biostratigraphical interpretations. It also serves to document a rapidly expanding literature which typically grows by several hundred articles per year (Jansonius and McGregor 1996, figure 1). The archive has since developed into a comprehensive, cross-referenced card index and associated personal library of palaeopalynology. The personal library contains, in addition to papers accumulated by John E. Williams, many reprints donated by M.C. Boulter, G.L. Eaton, A.J. Powell, J.B. Richardson and others. While the Quaternary is covered for acritarchs and dinoflagellate cysts, the principal emphasis is on the

pre-Quaternary. Papers on the Paleogene and Neogene which only use modern pollen/spore names have not been added to the JWIP. As of February 2012, the index card collection comprised 23,350 literature references and is housed in the Department of Palaeontology of The Natural History Museum (NHM) in London. The JWIP is available for use by all palynologists. This contribution aims to describe the collection, its background and history, how it has been constructed, its potential utility and how it may be developed in the future.

2. The use of card indexes and catalogues in palynology

Prior to the digital era, students of biology, palaeontology and other subjects would frequently construct alphabetical card indexes for taxa etc. Banks of index cards were a familiar sight in science laboratories as well as, for example, libraries and doctor's surgeries (Figure 1). In science these indexes would typically pertain to a specific research project, but could also be

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4.3. Announcement of a Special Issue on “The Time-Specific Facies: the color and texture of biotic events”: a volume is dedicated to the memory of Otto H. Walliser

Annalisa Ferretti, Kathleen Histon, Patrick I. McLaughlin, Carlton E. Brett

Time-Specific Facies: the color and texture of biotic events
Special Issue

Palaeogeography, Palaeoclimatology, Palaeoecology
367–368 (2012)

Bibliographic comments

Otto Walliser (1984a, 1984b, 1986) defined “time-specific facies” as distinctive facies restricted to a precise time-slice. Surprisingly, the concept has been largely neglected since its introduction. A key objective of the recently published volume, resulting in part from the symposium Time Specific Facies: The Color and Texture of Biotic Events, held at the International Palaeontological Congress (IPC) in London in 2010, is to raise awareness of the intriguing and diverse issues of time-specific facies (TSF), to illustrate and define the notion of TSFs and to provide examples that will, we hope, elicit further study on this important phenomenon in all parts of the geologic column.

Based on the selected papers in this Special Issue, we will seek to take the concept of marine facies beyond the simple idea of depth and paleogeographic controls on distribution of litho-, bio- and taphofacies and start to look at the temporal complexity.

Time-specific facies represent relatively short-lived and widespread occurrences of distinctive facies (Brett et al., 2012a). This definition of TSFs is broad enough to take in all of the examples documented in the Special Issue, as well as others. This definition may prove to be too all-encompassing and may need to be restricted in the future; at least that different scales of time-specific facies ultimately may be identified. Nonetheless, we deliberately chose to keep the definition broad at this time.

Overall, the seventeen papers included in this Special Issue have been organized to emphasize two main aspects of TSFs: firstly, the time-specific response of organisms to a changing environmental scenario provides a significant pattern that may be recurrent in time and space. In this case, the identification of the “texture” of widespread events becomes crucial in recognizing TSFs. Secondly, signatures may reveal much more widespread physical and geochemical phenomena, such as variation in the coupled ocean–atmosphere system, through specific coloring of the sedimentary successions. Hence, certain TSFs may truly be said to encompass the “color of events”.

The volume is dedicated to the memory of Otto H. Walliser.

Time-Specific Facies: the color and texture of biotic events

Edited by

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7. Silurian Research 2012: news from the members.

Anna Antoshkina (Russia): I am actively working on the Paleozoic reefs of the Urals and Lower Paleozoic sedimentation of the Timan-northern Ural region. During 2012 I intended to finish further manuscripts about the interval of the Lau Event and also start with Upper Wenlock Event.. Therefore together with C. Soja I having been working on an updated paleogeographic analysis of Upper Silurian reefs paleontologic data from the Alexander terrane of Alaska, Canada, Urals, Siberian showing strong links with the Uralian Seaway in the mid-Paleozoic.

William Ausich (USA): I am working on a variety of projects dealing directly or indirectly with the Silurian, including the following: 1, with Mark Wilson (College of Wooster), we are working Llandovery to Pridoli crinoids and communities from western Estonia; 2, as part of a large collaborative "Assembling the Echinoderm Tree of Life project", I am working on the phylogeny of crinoids and other echinoderms that includes the Silurian; 3, working on the history of Silurian echinoderms.

Alyssa Bancroft (USA): This academic year I have been teaching at my undergraduate institution, Lake Superior State University in Sault Ste. Marie, Michigan. In my spare time I am working on finishing my dissertation, and will defend this fall! Looking forward to catching up with everyone at the meeting in Lund this summer!

Chris Barnes (Canada) Work with Shunxin Zhang (Geological Survey of Canada, Iqaluit) continues 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. The geochemistry of Lower Paleozoic conodonts, particularly oxygen isotopes, is being pursued further in collaboration with Julie Trotter (University of Western Australia). After retiring as Director of NEPTUNE Canada in 2011, I am active in completing several Lower Paleozoic conodont studies as well as some ongoing ocean observatories activities as Professor Emeritus.

Alain Blicck (France): Research on Silurian vertebrates is, for the time being, secondary in my activities. I am mainly involved in Early Devonian ORS-like fish assemblages from Arctic Regions (Spitsbergen, Severnaya Zemlya, Chukotka). However, a review on Early Palaeozoic vertebrates and biogeography, including Silurian items, has been completed with Zivile Zigaite for the Geol. Soc. Memoir coordinated by both T. Servais and D. Harper in the course of IGCP project. Silurian-Devonian vertebrate biostratigraphy has also been reviewed for a short article in the French information geological journal "Géochronique". Additionally a popular scientific article has been written on conodont-vertebrate relationship in order to explain why conodonts (including Silurian conodonts) are not vertebrates, but at the best basal chordates.

Personnel comment

The conodont-vertebrate relationships have been a hotly debated topic in the early 20th Century, and at the end of last century and early 21st century. Contrary to what has been written in regular scientific papers, H. Pander did not originally say that conodonts WERE vertebrates. He always had doubts about this point (see new translations of original paper by H.-P. Schultze & S. Turner, in Blicck et al., 2011, Episodes, 33 (4) [2010] : 234-241). Additionally a remade cladistic analysis of all basal chordates and conodonts concludes that conodonts are, at the best, simply basal chordates, and have nothing to do with gnathostomes, vertebrates, craniates ... We also criticize the use of the Total Group Concept and Nomenclature for basal vertebrates as it has been applied by what we called "the British School" (Dick Aldridge and students). However, the debate is still open as we are unable to say what taxon conodonts are related to.

Several groups of "worms" are potential candidates. It might as well be that conodontophorids (conodont-bearing organisms) are just a separate group, but, even if so, it did have phylogenetic relationships with one or another higher taxon of "invertebrates" (cephalopods, gastropods, priapulians, annelids, chaetognaths, or whatsoever). The challenge is open to colleagues who would like to widen the phylogenetic analysis to all those groups, a terrific challenge because defining homologous features between so different organisms as graptolites and other sister-groups to chordates, chaetognaths, ammonites, etc. will be a VERY difficult task.

Carlton E. Brett (USA): Much of my effort in the summer of 2012 was directed toward organizing, together with Brad Cramer, and running the Foerste Symposium and associated field trips for IGCP 591: *The Early to Middle Paleozoic Revolution*. The meeting focused on Ordovician and Silurian sequence and event stratigraphy, using the classic venue of the Cincinnati Arch region as an exemplar. This meeting was attended by about 50 people representing 12 different countries. Formal talk sessions were preceded by a two-day field trip, July 22-23 with about 20 stops in the Upper Ordovician (Sadbrian-Katian) to Silurian (Llandovery-Ludlow) along the southeastern side of the Cincinnati Arch of Kentucky and southern Ohio. The technical session, held at the University of Cincinnati, on July 24 and 25, featured some 30 talks and posters from more than 50 authors. A mid-meeting dinner cruise was held on a riverboat on the Ohio River. The post-meeting field trip featured two days of study of about ten Upper Ordovician to Devonian outcrop sections on the northwest side of the Arch in southwestern Ohio, Kentucky and southern Indiana. This was followed by a one-day tour piloted by Donald Mikulic (Illinois Geological Survey) of sections, including the famed Thornton reef (Wenlock), in the vicinity of northern Illinois. Another highlight of the meeting was the three-dimensional digital imaging of classic Silurian outcrop section near Peebles, Ohio, by Carlos Aiken (University of Texas, Dallas) and his students prior to the field trip. During the trip, at the outcrop participants did an interactive overview of the outcrop using digital pads to illustrate features of sequence and event stratigraphy, as Brad and I pointed them out on the outcrop. The meeting was also supported by the Dry Dredgers, a very active group of amateur paleontologists affiliated with the University of Cincinnati.

All told, we highlighted about 40 outcrop sections in four states. Descriptions of these outcrop sections, together with overview chapters on the sequence stratigraphy, biostratigraphy, sedimentary processes and paleontology, are presented in a series of three field guides distributed at the meeting (see references below). In addition, road logs in these guides provide notations on well over 200 outcrop sections, seen in passing, during the various trips. Edited and updated versions of these field guides will be available on-line at the IGCP 591 website early in 2013 (For more details, visit the IGCP 591 website: <http://www.igcp591.org/meetings.php>.)

University of Cincinnati graduate students, James Thomka and Nick Sullivan, continue to make progress on Silurian of the Tri-states (Ohio, Indiana, Kentucky) area. Doctoral student Thomka is continuing research on the detailed cyclostratigraphy, sedimentology and comparative taphonomy and paleoecology of the upper Telychian-early Sheinwoodian Osgood and Massie Shale and the Homerian Waldron Shale from Tennessee to central Indiana and their correlatives in Ohio. In his second year of field study James focused on faunal changes associated with the early Sheinwoodian (Ireviken) bioevents. Masters student Sullivan has collected data on sequence stratigraphy, biostratigraphy, carbon isotopes, and magnetic susceptibility of the upper Llandovery Series in Ohio, Kentucky and in a comparative sense in the type Clinton area of New York State. In addition, both Thomka and Sullivan aided in measuring and sampling (for C isotopes) correlative sections of ferruginous mid Silurian strata in central Pennsylvania. These studies are refining our views associated with the Valgu and early Ireviken bioevents in eastern North America. Both students played key roles in the IGCP 591 field meeting and Sullivan and I ran a field trip on stratigraphy and paleoenvironments of the well-known Telychian age Clinton ironstones in the type area of Clinton, NY for the NY State Geological Association.

In addition, I worked collaboratively with PhD student Matt Vrazo and former student Jeff Trop (Professor at Bucknell University) on sequence stratigraphy and depositional environments in the Upper Silurian (Ludlow-Pridoli) Tonoloway Formation. These studies included documentation of a previously unknown eurypterid-bearing interval in the Tonoloway of Pennsylvania, discovered recently by Trop. Vrazo will incorporate this study into his dissertation studies on the paleobiology of Silurian eurypterids.

During the past year Pat McLaughlin and I have obtained more new data and have continued to generate several new carbon isotopic profiles that will provide significant insight into Silurian correlations in eastern North America. We also continue to work with Brad Cramer on issues of geochronology and calibration of Silurian time scales.

Olga K. Bogolepova (U.K.): I am currently working on Silurian organic-rich black shales of Russia with regard to their bio- and lithostratigraphy and geochemistry. I plan this summer fieldwork in the Caucasus and the Urals. I am also leading the CASP project on geology of Pai-Khoi. In 2012 I completed the CASP Severnaya Zemlya Project which was based on field observations and samples of middle Cambrian to Middle Devonian sedimentary rocks from October Revolution Island of the Severnaya Zemlya Archipelago. During the course of the project 12 reports on geology, biostratigraphy, palaeogeography, petrography, provenance studies, organic geochemistry, etc. were written. These results will be published over the coming years. For information see <http://www.casp.cam.ac.uk/>

Carole J. Burrow (Australia): I continue to work with Sue Turner (QM) and Godfrey Nowlan (GSC) on Late Silurian microvertebrate assemblages from several localities in the maritime regions of North America, in particular from Nova Scotia and Maine. I am also undertaking a revised description of *Ischnacanthus? scheii* from the ?Silurian/Devonian boundary in Ellesmere Island, arctic Canada, based on a closer look at the scales of this taxon and associated comparison with scales in contemporary assemblages of vertebrate microremains in other areas. A new ischnacanthiform from the Late Silurian of Canada is also under investigation, in collaboration with staff at the Royal Ontario Museum, Toronto. The search for more vertebrates from the Silurian of Australia inches on...

Bradley D. Cramer (USA): In the past year I have started in my new position as an Assistant Professor at the University of Iowa, Department of Geoscience, and finally have a real gig. Things are just getting underway here in Iowa and I look to continue my on-going work on Silurian dates, stratigraphy, and isotope geochemistry. New age dates continue to come in and we got lots of good stuff accomplished in 2012. Work with the usual US Midcontinent crowd (Carl Brett, Mark Kleffner, Pat McLaughlin, and a host of others) continued with a culmination of our efforts in the IGCP 591 2nd Annual Meeting in Cincinnati, Ohio, this past July. In addition, the special volume from the Ludlow meeting last year was published in *Bulletin of Geosciences* and is now available online through the IGCP 591 website at www.igcp591.org. Two major manuscripts were published this past year, the first with several new Silurian dates in *Geological Society of America Bulletin* (Cramer et al. 2012) and the second with a revision to the stratigraphic nomenclature of the Silurian strata along the Cincinnati Arch in *Bulletin of Geosciences* (Brett et al. 2012). In addition, the Geologic Time Scale 2012 was finally published and has a new Silurian time scale that is significantly improved from the last version (Melchin et al. 2012). Finally, the first manuscript on the Digital Integrated Stratigraphy Project (DISP) was published in *Bulletin of Geosciences* (Munnecke et al. 2012) that details our on-going work with the University of Texas at Dallas Cybermapping Laboratory. I look forward to seeing many of you at the upcoming IGCP meeting this year in Lund, Sweden, and details of the meeting are available at the IGCP 591 website.

Robin Cocks (U.K): has had another full year, completing and submitting a largely systematic paper on Late Ordovician (Katian and Hirnantian) brachiopods from Pembrokeshire, Wales, as a *Special Paper in Palaeontology*. Another systematic paper, on Late Ordovician brachiopods of the Chingiz-Tarbagatai Terrane in Kazakhstan, with Leonid Popov, was submitted to the *Journal of Systematic Palaeontology*. A paper with Cazibe Sayar on the Ordovician and Silurian faunas of the Pontides of Turkey was submitted and accepted by *Geological Magazine*. A paper on the whole Palaeozoic geography of Eastern Asia with Trond Torsvik was submitted to *Earth-Science Reviews*, and is now in proof, and another on Wegener and plate tectonics by Trond and I was submitted to and published by *Geologica Belgica*. Robin was a junior author on papers on submitted and published papers by Torsvik et al. on True Polar Wander in *Earth-Science Reviews*, and Jin et al. on the Late Ordovician equator in *Geology*. A new edition of the popular *British Palaeozoic Fossils* was edited and published. Robin spent some time in Nanjing, China, working with Rong Jiayu on the global distribution of Aeronian brachiopods, and also enjoyed the IGCP 591 meeting in Ohio in July.

Paul Copper (Canada/France): mentions the following collaborations and submitted manuscripts : McLean, R.A. and Copper, P. [submitted may 2012]. The Early Silurian (late Rhuddanian-Telychian) rugose coral fauna of Anticosti Island, eastern Canada: diversity during the post O/S mass extinction recovery interval. *Palaeontographica Canadiana*, ca. 580 pp, 50 pls, 12 text-figs; A submitted manuscript with Jisuo Jin and André Desrochers: [submitted nov 2012] The Ordovician-Silurian boundary (late Katian-Hirnantian) of western Anticosti Island, E Canada: revised stratigraphy and benthic faunal correlations. *Stratigraphy*, 46; A manuscript in preparation with Jisuo Jin on a revision of the Jupiter Fm (upper Aeronian-mid-Telychian), Anticosti island; another manuscript in preparation with Jisuo Jin on a revision of the stratigraphy and significance of the Silurian shelly recovery fauna of the Rhuddanian Becscie Fm, Anticosti, east to west; and monographic work on the Early Silurian spire-bearing brachiopods --vol. 1 Atrypida (ca. 14 genera, 70 spp.) , vol. 2, Athyridida (ca. 13 genera, 30 spp.), vol. 3 Spiriferida (5 spp. 3 genera) of Anticosti island.

Maria Giovanna Corriga (Italy): I'm working on conodont taxonomy and biostratigraphy across the Silurian/Devonian boundary in Sardinia, the Carnic Alps and other North Gondwana regions. In the Carnic Alps I'm investigating the Silurian and Lower Devonian *Orthoceras* Limestones, and several sections are in study. The taxonomic and biostratigraphic study of the conodont fauna from several sections spanning the Silurian/Devonian boundary is in progress; this interval have been sampled in detail in the Cellon section (with H.P. Schönlaub and C. Corradini).

Carlo Corradini (Italy): I'm working on Silurian and Devonian of North Gondwana, mainly in Sardinia and in the Carnic Alps. In the Carnic Alps I'm investigating the Silurian and Lower Devonian *Orthoceras* Limestones, and several sections are in study. The taxonomic and biostratigraphic study of the conodont fauna from several sections spanning the Silurian/Devonian boundary is in progress; this interval have been sampled in detail in the Cellon section (with H.P. Schönlaub and M.G. Corriga). A revision of the biostratigraphy of the Silurian part of the Cellon section is in progress. A project with the goal to achieve a formal lithostratigraphy of the pre-Variscan sequence of the Carnic Alps is in progress: it involves several colleagues from Italy, Austria and other countries. In Sardinia I'm studying calcareous sections (with M.G. Corriga) and black shales outcrops (with S. Piras).

André Desrochers (Canada): I am actively working on Upper Ordovician to Lower Silurian strata exposed on Anticosti Island. Our recent studies (Achab et al, 2012) suggest that the whole Ellis Bay Formation is of Hirnantian age based on the presence of a Hirnantian shelly fauna, the comparison of the Anticosti chitinozoan assemblages with those from other sections dated by graptolites and the available stable isotope geochemistry information. Current research projects at the University of Ottawa by graduate students include: i) depositional setting and geochemistry of Upper Ordovician

black shales in the subsurface of the Anticosti Basin, ii) utility of conodonts for (U-Th)/He analysis, testing the hypothesis that conodonts can represent a reliable low-temperature thermochronometer in carbonate sedimentary successions. A number of collaborative projects are in progress including: 1) a sequence stratigraphic perspective on the Late Ordovician Glaciation (with J.F. Ghienne et al.), 2) the use of $\delta^{18}\text{O}$ values of conodont apatite for testing whether significant orbital-scale climatic fluctuations controlled the growth/melting of continental glaciers resulting in glacio-eustatic sea-level changes and the development of widespread marine sedimentary cycles during the late Ordovician (with Maya Elrick); and 3) a revised stratigraphy of the Ordovician-Silurian boundary (late Katian-Hirnantian) of western Anticosti Island (with P. Copper and J. Jin).

Annalisa Ferretti (Italy): I have recently edited, together with K. Histon, P. McLaughlin and C. Brett, a Special Issue of *Palaeogeography, Palaeoclimatology, Palaeoecology* "Time-specific facies: the colour and texture of biotic events" (Ferretti, Histon, McLaughlin & Brett, 2012a, b, vol. 367-368, 280 pp.), a thematic set of papers arising from the Third International Palaeontological Congress IPC3 2010 Symposium: "Time-specific facies: the colour and texture of biotic events". The concept of "Time-Specific Facies" is introduced and discussed (Brett, McLaughlin, Histon, Schindler & Ferretti, 2012). In the same issue, remarkable color patterns attributed to microbial activity in the Silurian of the Carnic Alps are described and interpreted (Ferretti, Cavalazzi, Barbieri, Westall, Foucher & Todesco, 2012). Fossilized ring-like structures with enigmatic function and taxonomic affiliation are described from the Upper Ordovician of the Carnic Alps and the Silurian of Bohemia (Ferretti, Cardini, Crampton, Serpagli, Sheets & Storch, in press). Finally, a provocative short discussion focusing on the term "black-shales" has been produced (Ferretti, Melchin & Negri, 2012).

Mansoureh Ghobadi Pour (Iran): In present, my ongoing research projects are focused on various aspects of taxonomy, biogeography and palaeoecology of the Llandovery benthic faunas from Central Iran and the Kopet-Dagh Region with a special attention to trilobites. I also continue my work on the Ordovician –Silurian boundary beds in the Zagros Basin.

Luke Hauser (U.K.) I have been working on the Downton Bone Bed above the Ludlow Bone Bed in the Welsh borders. I have almost completed the initial sedimentological analysis and lithostratigraphy. I have started to process the bone bed and am pioneering a new technique to recover the phosphatic microfossils. I have also started to look at the trace fossils and palynomorphs contained within the bed with some promising results. Last year I presented a poster at the SVPCA (Symposium of Vertebrate Palaeontology and Comparative Anatomy) and travelled to Estonia in to meet Dr Tiit Märss who has now become my third supervisor.

Olle Hints (Estonia): I continue to work on Ordovician and Silurian microfossils, particularly scolecodonts, but also chitinozoans and conodonts. Together with Petra Tonarova (in Tallinn for postdoc since 2013) and Mats E. Eriksson (Lund) we aim at getting a better picture of the diversification of Silurian jaw-bearing polychaetes. Together with Viiv Nestor (Tallinn) and Liina Paluveer (PhD student in Tallinn) we compile data on Baltic Ordovician and Silurian chitinozoans and conodonts in order to analyse it by means of quantitative stratigraphy, including CONOP9. The first results will be presented at the IGCP591 Annual Conference in Lund, June 2013.

Kathleen Histon (Italy): I continue to work on various aspects of the nautiloid cephalopod fauna from the Silurian successions in the Carnic Alps (Austria) in order to document faunal recovery and exchange during the Silurian and response to eustatic/climatic changes on a local scale. I am also working on collections of Silurian nautiloids from the Graz Palaeozoic (Austria). As part of my research activities I spent two weeks studying collections of British Silurian nautiloids at the Natural History Museum London (May 2012) with a grant from the SYNTHESYS Program.

A Special Issue: Time Specific Facies: the color and texture of biotic events in *Palaeogeography, Palaeoclimatology, Palaeoecology* (2012: vol. 367-368, 272 pp.) co-edited with A. Ferretti, P. McLaughlin and C.E. Brett was completed and includes several papers on the Silurian.

As part of my activities as co-leader of UNESCO/IUGS IGCP Project 591 I was co-convener with Vinod Tewari (India) and Mike Melchin (Canada) of the IGCP 591 symposium at the 34th IGC (Brisbane, Australia, 2012). I received a grant from the IGC Geohost program towards conference expenses. A symposium proceedings volume is in preparation to be published in 2013 as Special Issue: Pre-Mesozoic Climates and Global Change in *Palaeogeography, Palaeoclimatology, Palaeoecology*. (eds. K. Histon, V. Tewari and M. Melchin)

David Holloway (Australia): I continue to work on trilobite faunas from the Silurian and Lower Devonian of eastern Australia. Projects in progress include late Llandovery scutelluids and illaenids from north Queensland (jointly with Phil Lane, Keele University, UK), and the genera *Poroscutellum* and *Spiniscutellum* from the Lower Devonian of Victoria. Papers on scutelluid trilobites from Wenlock to Ludlow limestones in central western New South Wales (also jointly with Phil Lane) and the phacopid *Reedops* from the Pragian of Argentina (jointly with Juan José Rustán, Universidad Nacional de Córdoba, Argentina) were published during 2012, and a paper on a new proetid genus related to *Tropidocoryphe*, from the Wenlock to Ludlow of New South Wales, was completed. The 'Siluro-Devonian Studies 2' volume, jointly edited with John Laurie (Geoscience Australia, Canberra), will be published early in 2013 as Memoir 44 of the Association of Australasian Palaeontologists. It will include 15 papers on brachiopods, trilobites, graptolites, corals, stromatoporoids, conodonts, palynology, and stratigraphy and palaeoecology.

Helen Hughes (U.K.): I continue to work on the Sheinwoodian of the southern Midland Platform, in collaboration with Dave Ray. Integrated study of $\delta^{13}\text{C}_{\text{carb}}$ data, palaeoenvironments, and sequence stratigraphy over the Ireviken Event interval in this area is progressing well.

Jisuo Jin (Canada) is working on biodiversity change and latitudinal gradient of tropical biodiversity of brachiopods and related biofacies in Laurentia during the Late Ordovician and Early Silurian. One of the highlights of research activity in 2012 was using brachiopod shell beds and Massive Bedded Thalassinoides Facies to locate the Late Ordovician Equator of Laurentia.

Markes E. Johnson (USA): I continue to co-operate with Gudveig Baarli on the study of intertidal biotas of all geological systems on a global basis. Our data base (including an extensive bibliography on the Silurian) and summary article was recently published in the 2012 volume "Earth and Life" edited by John A. Tallent. Figure 10 in the fore-mentioned article, for example, illustrates a slab of Lower Silurian Otsquago Sandstone (South Moyer Creek, eastern New York State) with negative imprints of the meandering trails of the gastropod *Archaeonassa fossulata*.

Dimitri Kaljo (Estonia): I am continuing studies on the Ordovician and Silurian bio- and chemostratigraphy of Baltica and elsewhere for comparison. Some projects in cooperation with colleagues in Sweden and Ukraine (Podolia) are in progress. Some others lie dormant. Last year I spent much time writing together with colleagues a history book in Estonian about our institute (a summary see Heinsalu, A., Hints, O. & Kaljo, D. 2012. Anniversaries provoke interest in lessons gained from history. Est. J. Earth Sci., 61, 193–194. Our publications in this journal are available online (www.eap.ee/earthsciences).

Erika Kido (Austria): I am working on the Silurian-Devonian rugose corals especially from Japan and the Carnic Alps (Austria-Italy). Since 2011 I research for the second postdoc project (accepted by the Austrian Science Fund) together with Thomas Suttner, which focuses on the Middle Devonian climate perturbations and effects on tropical coral communities.

Tarmo Kiipli (Estonia): I am working on correlation and interpretation of Silurian volcanic ash beds in Baltoscandian region.

Mark Kleffner (USA): I am actively involved in five projects with several different colleagues: (1) Aeronian-Telychian biochemostratigraphy of Ohio and New York; (2) conodont biostratigraphy, oceanic episodes, and $\delta^{13}\text{C}$ chemostratigraphy of Silurian/Devonian boundary strata in New York; (3) conodonts, graptolites, Ireviken Event and Ireviken $\delta^{13}\text{C}$ excursion in the Estill Shale; (4) oceanic episodes, $\delta^{13}\text{C}$ chemostratigraphy, and updated Homeric, Gorstian, and Ludfordian (Silurian) conodont biostratigraphy of the North American Midwestern Basins and Arches region of southern Laurentia; and (5) a revised conodont-, graptolite-, chitinozoa-, and event-based Gorstian-Lochkovian (Silurian-earliest Devonian) chronostratigraphy.

Jiří Kříž (Czech Republic): I studied the palaeogeography of a volcanically influenced Ludlow sea floor in the Central Prague Basin (Silurian, Bohemia, Perunica) together with Lesley Cherns, Cardiff and Štěpán Manda, Prague. The paper will be submitted next year when the illustrations will be processed by Štěpán Manda.

Other news: I am retired and I worked for the Czech Geological Survey just for 20%. I continued with the transfer of my Lower Paleozoic Bivalvia collection from Bohemia and Europe to the Czech Geological Survey collections. In 2012 more than 18.500 items (more than 20 000 specimens) together with detailed database were transferred.

Philippe Legrand (France): I am studying Lower Silurian graptolites of Algerian Sahara.

Alain Le Hérisse (France) I continue to work on the the impact of the late Ordovician glaciation on the evolution of organic-walled microphytoplanktonic associations, and the identification of reliable index taxa in the upper Ordovician and early Silurian. Two papers accepted for publications will concern the situation to the Ordovician/Silurian boundary in northern Chad, and in Saudi Arabia. Another important program of research concerns the establishment of operational palynology based on organic-walled microphytoplankton, in collaboration with Petrobras, on the Paleozoic sequences (Ordovician, Silurian and Devonian) of northern basins in Brazil.

Alfred Lenz (Canada): I am working on several projects; the first, in collaboration with Anna Kozłowska and Mike Melchin, being a study of Aeronian and early Telychian retiolitid graptolites from Arctic Canada, based on a large collection of superbly preserved, isolated, 3D material. The project is near completion. A second project, in collaboration with the geochemist Fred Longstaffe of Western University, is a study of Carbon and Oxygen of Wenlock through the Ludlow graptolite sediments of Arctic Canada.

This project also includes analyses of the isolated graptolites in the same sections. This project is just getting underway. The third project is a taxonomic and biostratigraphic study of Lower Devonian graptolites from Arctic Canada. Preliminary studies show that diversity is among the highest in any region globally.

David Loydell (U.K.): 2012 saw continuation of work on the graptolites from Aeronian-Telychian sections around the El Pintado reservoir, Spain. Diversity is very high indeed. Projects on Northern Gondwanan hydrocarbon source rocks were completed and submitted for publication.

Peep Männik (Estonia): I am actively working on evolution, taxonomy and palaeoecology of conodonts, conodont-based high-resolution stratigraphy, bioevents and palaeogeography. I am also interested in sequence stratigraphy and evolution of sedimentary basins. My studies will continue under projects “Changes in the Telychian–lower Sheinwoodian conodont faunas as a proxy for basin evolution in northern Baltic”, “Ordovician and Silurian biodiversity in Baltica: evolution and impact of the changing environment” and “Quantitative stratigraphical approach to early Palaeozoic chitinozoans and conodonts of the Baltic area: high-resolution time scales and palaeobiodiversity”. Additionally, a small project dealing with conodont faunas from base Aeronian and Telychian GSSPs is in progress. Also, joint studies together with colleagues from Estonia, Germany, Iran, Russia, Sweden, U.K. and USA on evolution and high-resolution stratigraphy of the Early Palaeozoic faunas and sedimentary basins on different palaeocontinents are going on.

Tiiu Marss (Estonia): I am distributing our recent publications (see reference list), which can be downloaded from our server: www.gi.ee/~genu/WML.zip. The pdf of the article Wilson, M.V.H. & Märss, T. 2012. is a very big file which you download from: http://www.kirj.ee/public/Estonian_Journal_of_Earth_Sciences/2012/issue_4/earth-2012-4-261-276.pdf

Alexander (Sandy) D. McCracken (Canada): I continue to work on Middle to Upper Ordovician, Silurian and Devonian conodonts from various localities.

Michael J. Melchin (Canada): I am currently working on several projects related to graptolite biostratigraphy and biodiversity through the Late Ordovician and Early Silurian, particularly in North America, Europe, and China. I am collaborating with Charles Mitchell, David Sheets and Petr Storch, on the study of Late Ordovician–Early Silurian faunas in Bohemia, Scotland, and Fan Junxuan and Chen Xu on the study of Rhuddanian–early Telychian graptolites from South China. I am working on a project with Dan Goldman, Chuck Mitchell, Fan Junxuan and others on quantitative graptolite biogeography. We are also working together with Chris Holmden, MSc student Peter Bullock, and others on the stratigraphy and isotope chemostratigraphy of the same successions. My graduate student, Jason Loxton, is very near completion of a study of biodiversity dynamics through the late Katian to earliest Rhuddanian in Northern Yukon and the systematics of the Late Ordovician graptolites. I have been working with Alf Lenz and Ania Kozłowska on some isolated Llandovery graptolites. I am also expanding my research interest in the distribution, geochemistry, and origin of black shales in Ordovician–Silurian time.

Tatiana L. Modzalevskaya (St. Petersburg, Russia): I’m keeping on working on Cambrian–Silurian–Devonian brachiopods of Iran from Kopet-Dag and Derenjal Mountains in collaboration with Leonid Popov (UK). The paper ‘*Cambrian (Furongian) rhynchonelliform brachiopods from the Eastern Alborz Mountains, Iran.*’ by Leonid E. Popov, Mohammad-Reza Kebria-ee Zadeh, Mansoureh Ghobadi Pour, Lars E. Holmer & Tatiana L. Modzalevskaya will be considered for publication in *Bulletin of Geosciences*. Together with Prof. Fernando Alvarez (Spain) a paper ‘Evolution, migration and biogeography of the plicathyridine brachiopods with a revision of Devonian faunas from the Kuznetsk Basin’ was prepared to the memoirs series of the Association of Australasian Palaeontologists (AAP).

Jan Mortier (Belgium) continues his PhD study on the lithostratigraphy, biostratigraphy with chitinozoans and palaeoenvironmental reconstruction of the Silurian of the Condroz Inlier (Belgium), especially in a series of outcrops near Neuville-sous-Huy. Petr Storch is looking in collaboration with him at the graptolites collected in these ravines. Jan is working with Steven Esselens and his promotor Jacques Verniers to write up a manuscript on the dating with chitinozoans of volcanoclastic rich and some macrofossil bearing units near Hennuyères, Brabant Massif, Belgium (uppermost Ordovician-lowermost Silurian?).

Axel Munnecke (Germany): I am currently working on Ordovician and Silurian (chemo-)stratigraphy in different areas (China, Gotland, Poland, Podolia). In addition, I am very interested in the biological response to the pronounced climatic changes that took place during this time. In December 2012 we published a manuscript documenting high abundances of malformed acritarchs during the onsets of pronounced carbon isotope excursions.

Viiu Nestor (Estonia): I am still working on the Silurian chitinozoans. This year I shall continue revision of all species identifications for the East Baltic Silurian biostratigraphic database, within the frame of the project "Quantitative stratigraphical approach to early Palaeozoic chitinozoans and conodonts of the Baltic area: high-resolution time scales and palaeobiodiversity", guided by Olle Hints.

Arne Thorshøj Nielsen (Denmark): I am new in the Silurian forum, but now working on the Silurian (Wenlock-Llandovery) of Bornholm, Denmark. Two drill-cores have been made and the entire section, which proved to be c. 175 m thick, is cored. The study will include sedimentological description of the succession, detailed geochemical analyses, geophysical log stratigraphy and – in corporation with relevant experts – graptolite based biostratigraphy. My key interests are regional stratigraphy, depositional environment and sequence stratigraphy (incl. reconstruction of sea level changes).

Godfrey Nowlan (Canada): I am currently working with Carole Burrow and Sue Turner on Silurian vertebrate microfossils from the Stonehouse Formation of Arisaig, Nova Scotia, Canada; a manuscript has been submitted. I also continue to write reports on conodonts from samples collected by various researchers working on Geological Survey of Canada Programs. Four reports on 24 samples were completed in 2012 including some samples from Silurian formations in the Northwest Territories, Canada.

Vincent Perrier (France): After 3 years in the University of Tartu (Estonia), I am at present Post-doc in the University Leicester, UK. My research focuses on the colonization of pelagic environments by Myodocope Ostracodes during the Upper Silurian. Ostracods form an important component of zooplankton, adapting to this pelagic lifestyle during the Silurian, an ecological shift coincident with oceanographic and zooplankton biodiversity change. The recent discovery of Silurian myodocopes with soft-anatomy has revolutionized understanding of their palaeobiology and for the first time enables a detailed assessment of the morphological adaptations that may have facilitated a zooplanktonic lifestyle. This project seeks to determine the feedbacks that produced an ostracod zooplankton, scrutinizing the extensive Silurian fossil record of myodocopes, determining their ancient environmental distribution, biodiversity and morphology, and identifying the drivers of the ecological transition.

I also continue my collaboration with the University of Tartu on how Baltic ostracods reacted to rapid environmental changes in the Lower Palaeozoic. The different crises include: climate / sea level changes (Hirnantian Glaciation), sedimentological changes (Katian / Telychian Bentonites), meteorite impact (Kärdla impact) and water chemistry changes (Ireviken excursion).

José Manuel Piçarra (Portugal): I'm working on the Lower Paleozoic stratigraphy of South Portugal (Ossa Morena Zone) and also on the Ordovician and Silurian graptolites from Portugal. He mentions also to be a Member of the IGCP Portuguese Committee.

Leonid E. Popov (United Kingdom): Currently I am actively working various aspects of the Llandovery (Aeronian) faunas from Kopet-Dagh and in Central Iran in cooperation with Mansoureh Ghobadi Pour (Gulestan University, Gorgan) and Vachik Hairapetian (Azad University, Khorosgan Branch, Esfahan). I continue my monographic work on the Wenlock brachiopod faunas from the Zerafshan-Hissar region (Uzbekistan) in cooperation with Irina Kim (Uzbek Geological Survey, Tashkent), and the Llandovery brachiopod faunas of Chingiz Range in Kazakhstan.

David Ray (U.K.): My research activities over the past year have focused upon sequence stratigraphy and bentonite correlation within the Wenlock Series of the Midland Platform (England). In collaboration with Thomas Richards, Carl Brett, Andrew Morton and Abigail Brown I have focused upon the Homerian of the Malvern, Suckley and Abberley Hills (Herefordshire and Worcestershire), allowing for detailed correlation with coeval sections of the West Midlands and Shropshire. In addition, collaboration with Helen Hughes has focused upon sequence and carbon isotope stratigraphy within the Sheinwoodian of Gloucestershire and Herefordshire. I hope the results of these projects will be published in 2013.

Jiayu Rong (China). Is doing amongst many other things, fieldwork in western Sichuan, western marginal belt of the Upper Yangtze Region on the Upper Ordovician and Lower Silurian.

Valeri Sachanski (Bulgaria): I am actively working on Ordovician-Devonian stratigraphy of Bulgaria and Turkey and especially to Silurian-Lower Devonian graptolite biostratigraphy.

Paul A. Selden (USA): I have done little on the Silurian recently, except describe a new scorpion from Wales, together with Jason Dunlop. I have included a few references to Ordovician and Devonian work, which might also be of interest to Silurian Times readers. Most of my current research is on spiders, from Carboniferous to Cretaceous mainly, though I am doing a little on other arthropods, e.g. Cambrian oddballs, Carboniferous eurypterids, and Mesozoic myriapods.

This is the abstract of the forthcoming *Arachnology* paper: "Fragments of a fossil scorpion collected from Silurian (Ludfordian, c. 420 Ma) strata near Trecastle in Powys, Wales, are described. They represent one of the oldest records of Scorpiones, of which only five other species are known from the Silurian. Given the incomplete nature of the new material, which includes a largely complete carapace with anteriorly positioned median eyes, we cannot assign it to any particular family or genus.

However, the pustulate carapace ornament and preserved pattern of sulci are reminiscent of certain, much larger, fossil scorpions such as the Devonian *Praearcturus gigas* Woodward, 1871 and the Carboniferous *Gigantoscrapio willsi* Størmer, 1963.

Constance M. Soja (USA): Anna Antoshkina (Syktyvkar, Russia) and I having been working on an updated paleogeographic analysis of Silurian-Early Devonian paleontologic data from the Alexander terrane of Alaska and Canada, demonstrating strong links with the Uralian Seaway (proto-Arctic Ocean basin) in the mid-Paleozoic. Brian White (Smith College, Massachusetts, USA) and I reported the high degree of similarities in limestone and clastic facies of the Upper Silurian-Lower Devonian Karheen Formation (Alexander terrane) with coeval Old Red Sandstone deposits, which further establish a strong connection between the Alexander terrane and the North Atlantic Caledonides in the mid-Paleozoic.

Petr Štorch (Czech Republic): I am currently working on upper Silurian sections in the western part of the Prague Synform. The study, carried out in cooperation with Štěpán Manda, Ladislav Slavík and Jiří Frýda, focused on high-resolution biostratigraphy, faunal dynamics and systematic revision of the graptolite fauna. We rely on several trenches which exposed entire Ludlow succession, rich in graptolites associated with other, mostly pelagic faunal elements. While the middle and upper Ludfordian (*inexpectatus* – *transgrediens* zones), including effects of the Lau/Kozłowskii Event, have been already published, data from upper Gorstian, lower Ludfordian (i.e. upper *scanicus-chimaera* – *tenuis* zones) and Leintwardinensis Event are ready for publication. Results and conclusions acquired from the lower part of the succession (*nilssoni* – lower *scanicus-chimaera* zones) will be submitted for publication later in 2013 in collaboration with Sergio Piras. Other major topics include carbon isotope stratigraphy of the Llandovery succession (with Jiří Frýda) and related collaboration with Mike Melchin and Charles Mitchell. Joint work continues with Jan Mortier (integrated chitinozoan-graptolite stratigraphy of Condroz Inlier, Belgium), Wang Jian (Llandovery-Wenlock boundary graptolites of southern Shaanxi) and Juan Carlos Gutiérrez-Marco (graptolites of Valongo Syncline, Spain). Unavoidable reevaluation of some Silurian GSSPs decided by the Silurian Subcommittee in Ludlow (2010) inspired ongoing multidisciplinary study of two potential candidate sections in the Barrandian area (Prague Synform): Rhuddanian-Aeronian boundary section in Hlasna Treban and Sheinwoodian-Homerian boundary section in Kosov Quarry.

Petra Tonarová (Czech Republik/ Estonia): I defended my PhD thesis at the Charles University in Prague on December 2012 (Czech Republic) on Silurian scolecodonts of the Prague Basin. Now, I'm working at the Institute of Geology at Tallinn University of Technology (Tallinn, Estonia) together with Olle Hints on the Silurian jawed polychaete worms of the Baltic area and trends in their diversification in this time period.

Sarah Jane Veevers (UK): I am currently working with Alan Thomas on a full revision of the sedimentology and sequence stratigraphic significance of the Ludlow Bone Bed Member and its correlatives as a short-lived transgressive pulse within an overall regressive sequence. We are also collaborating with Rob Hillier to reinterpret the sedimentology of the Skomer Volcanic Group in Pembrokeshire, including possible chemostratigraphical correlation of some faulted sections.

Jacques Verniers (Belgium): With Thijs Vandenbroucke, Mark Kleffner, Brad Cramer, Cart Brett and two B.Sc students we presented at the IGCP 591 meeting in Cincinnati in July 2012 the first results on the re-analysis of Tryon Park and we are working on the manuscript. I still try to finish the manuscript on the chitinozoans around the Silurian-Ordovician boundary in two boreholes (Rostanga and Lönstorp) in Scania (Sweden), provided by Arne Nielsen, in which Tania Koren made a detailed graptolite biozonation around the Ordovician-Silurian transition.

Olev Vinn (Estonia): I am actively working on the palaeontology of problematic calcareous tubeworms from the Palaeozoic (e.g. cornulitids, tentaculitids, microconchids etc.) and evolution of tubeworm biomineralization. I am currently also working on the evolution of bioerosion and biofouling of hard substrates in the Silurian of Baltica.

Christopher Waid (USA): I recently collected conodont specimens in Irondequoit, NY from the Densmore Creek Phosphate Bed member of the Maplewood Formation, Lower Clinton Group; a unit where conodonts have not previously been found. Most of the specimens were not very well preserved, but a full Pa element of *Icriodella discreta* was recorded, as well as two possible Sb1 elements of *Pterospirifer eopennatus*. I will be expanding this research to other units of the Lower Clinton Group as a directed study under the advisement of Dr. Jeff Over (SUNY Geneseo).

Zhan Renbin (China): Together with my Chinese colleagues, I was concentrating on the recovery and re-radiation of brachiopods and corals after the end-Ordovician mass extinction in South China. Some very rare but very good material has been found and collected in southwest China (palaeogeographically the Yangtze Platform of South China palaeoplate), and systematic study is now going on. Besides, we have made a global review for the earliest representative of eospiriferid brachiopods, and further discussed their dispersal pattern and palaeogeographic significance. In order to organize a successful Field Workshop for IGCP 591 in August 2014, I, together with my colleagues, have done a lot of preparations in 2012 including design a post-conference field excursion to northern and western Yunnan Province, SW China. During the excursion, we will visit some wonderful Ordovician and Silurian sections of three different palaeoplates: South China, Indo-China and Sibumasu (complete sequences and abundant fossils of various groups).

Zhang Yuandong: (China): I am working on the graptolites of the Ordovician-Silurian transition interval and late Wenlock to early Ludlow from western Yunnan (Sibumasu Terrain), and the Telychian graptolites from central Yunnan (Indo-china Terrain). Since little has been known about the Silurian from these blocks, the graptolite biostratigraphy and the graptolite fauna may substantially improve our understanding of the contemporary geological history of the blocks.

Zhao Wen-jin (China): I am actively working on the Siluro-Devonian vertebrate paleontology, stratigraphy and paleogeography. I continued this year to focus on the study of Silurian fishes and Silurian/Devonian boundary in China. In this spring of autumn, together with my colleagues, I conducted twice field works in Yunnan Province and Jiangxi Province of China, respectively. Some new fossil fishes from Silurian strata have been collected. Four publications were published this year.

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9. ISSS Membership corner

9.1. New members

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