

# SILURIAN TIMES

No. 17

(Year 2009)

Newsletter of the International Subcommission on Silurian Stratigraphy



**Year 2009**

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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. 17**

**June 2010 for the year 2009**

<b>CONTENTS</b>	<b>2</b>
<b>1 International Subcommission On Silurian Stratigraphy of the ISSS , Editor's Notes &amp; Web Site for the Silurian Subcommission</b>	<b>3</b>
<b>List of all corresponding members( situation end of 2009;</b>	<b>4</b>
<b>2. Chairman's Corner</b>	<b>5</b>
<b>3. Annual Report of the Sub-Commission on Silurian Stratigraphy on 2009</b>	<b>6 – 11</b>
<b>4. Report on the ISSS business meeting in Sardinia, Italy, 6 June 2009</b>	<b>12-15</b>
<b>5. Obituary Barrie Rickards</b>	<b>16-21</b>
<b>6. Reports of Meetings in 2009:</b>	
<b>6.1: Silurian Field Meeting in Sardinia, Italy, 2009.</b>	<b>22-26</b>
<b>6.2. Paleozoic Seas Symposium (14-18<sup>th</sup> September 2009, Graz, Austria</b>	<b>27</b>
<b>7.1 Annoucement of next ISSS Meeting: "Siluria revisited" July 2011</b>	<b>28-29</b>
<b>7.2 Meetings In 2010 And Future</b>	<b>30-32</b>
<b>8. Silurian Research 2009</b>	<b>33-39</b>
<b>9. Silurian Publications 2009</b>	<b>40-55</b>
<b>10.1 New members of the ISSS and 10.2 Changes of email addresses</b>	<b>56</b>
<b>10.3 Changes of address</b>	<b>57</b>
<b>10.4. List of all titular, corresponding and interested Silurian workers (Dec 2010)</b>	<b>58-62</b>
<b>10.5 List of bounced email addresses,and missing email addresss</b>	<b>62</b>

**INTERNATIONAL UNION OF GEOLOGICAL SCIENCES**

President: Prof. Alberto C. Riccardi (Argentina)

Secretary General: Dr. Peter T. Bobrowsky (Canada)

<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, e-mail: [mmelchin@stfx.ca](mailto: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](mailto:mannik@gi.ee).

**Secretary:** Jacques Verniers, Research Unit Palaeontology, Department of Geology and Soil Science, Ghent University, Krijgslaan 281 building S8 WE13, BE-9000, Gent, Belgium, e-mail: [Jacques.Verniers@ugent.be](mailto:Jacques.Verniers@ugent.be).

**List of Task Groups and their officers**

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

**Base of Wenlock:** David Loydell, England: [david.loydell@port.ac.uk](mailto:david.loydell@port.ac.uk)

**List of Titular Members** (sept 2008-2012) (n=15)

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**EDITOR'S NOTES**

I wish to thank 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 62 voting or corresponding members. The list of Silurian workers who showed an interest to receive "Silurian Times" contains close to 250 persons. Possibly still more researchers want to inform the Silurian community about their current projects and publications. I could include all the references on Silurian publications that you sent me, together with publications of 2009 on the Silurian I collected from the Web of Science. Many thanks go to Dr. Brad Cramer for making a new and attractive cover of .Silurian Times 17.

Jacques Verniers, Secretary (Sunday, 27 June 2010)

**THE WEB SITE FOR THE SILURIAN SUBCOMMISSION**

All members can check the website for the ISSS (<http://www.silurian.cn>) prepared by Fan Juanxuan and Zhao Hui at the Nanjing Institute of Geology and Palaeontology, with input from the ISSS executive.

**INTERNATIONAL SUBCOMMISSION ON SILURIAN STRATIGRAPHY (ISSS)****List of all corresponding members( situation end of 2009; n= 64)**

(with year of election) (without date: corresponding member from before 1995)

Aldridge (UK)	Lenz (Canada)
Antoskhina (Russia)	Legrand (France)
Baarli (USA) 2002	Maletz (USA) 2002 Märss (Estonia) 1999
Barnes (Canada)	Modzalevskaya ( Russia) 1999
Bassett (UK)	Musteikis (Lithuania)
Berry (USA)	Nestor H. (Estonia)
Bing Huang (P.R.China) 2009	Norford (Canada) 1995
Bjerreskov (Denmark)	Paris (France)
Blieck (France)	Piçarra (Portugal)
Bogolepova (UK) 2002	Radziadicius (Lithuania) 2007
Boucot (USA)	David Ray (U.K.) 2009
Calner (Sweden) 2005	Robardet (France)
Caputo (Brazil)	Rong, Jiayu (China)
Chen (China)	Schonlaub (Austria)
Cocks (UK)	Sennikov (Russia) 1999
Corradini (Italy) 2007	Serpagli (Italy)
Cramer Brad; (U.S.A.) 2009	Lawrence Sherwin (Australia) 2009
Einasto (Estonia) 1996	Simpson (Australia) 2002
Eriksson (Sweden) 2005	Storch (Czech Rep.)
Fan Junxuan (China) 2005	Strusz (Australia)
Ferretti (Italy)	Su Wembo(China)
Fu (China) 1996	Suyarkova (Russia) 2007
Geng (China)	Tang Peng (China) 2005
Gutierrez-Marco (Spain) 1995	Teller (Poland)
Hansch (Germany)	Tesakov (Russia)
Hints (Estonia) 2007	Walliser (Germany)
Holland (Ireland)	Wang Nian Zhong (China) 1999
Jell (Australia)	Wang Yi (China) 2005
Jeppsson (Sweden) 1995	Zhan Renbin (China) 2005
Kaljo (Estonia)	Zhang Yuan Dong (China) 1999
Kozłowska (Poland)	Zhao Wenjin(China) 2009
Larsson (Sweden)	Zigaite (Lithuania) 2007

## 2 CHAIRMAN'S CORNER

Dear Colleagues,

I wish to begin this message with a final, sincere thanks to Carlo Corradini, Annalisa Ferretti, and their whole group of colleagues who worked so hard to put together a successful meeting in Sardinia last year. It was exceptionally well organized in the technical sessions, the field excursions and in the wonderful social events. The technical presentations represented a wide range of integrated approaches that we, as a group, are taking to unravel the history of environmental, biotic and tectonic changes through the Silurian. I look forward to the continuation of these exciting lines of research.

Second, I wish to thank our Russian colleagues for their ambitious attempts to organize a meeting that would have taken us from St. Petersburg to the subpolar Urals. We regret that the meeting is not possible at this time and we certainly understand the financial circumstances that have led to that. Fortunately, David Loydell, Brad Cramer, David Ray, and Jan Zalasiewicz have put together an excellent plan to run an ISSS meeting in the summer of 2011 centred in the Ludlow area of UK. The field trips will focus on the British Silurian GSSPs and their stratigraphic context. We felt that the time was ripe for the ISSS, as a group, went to study those sections again. The ISSS executive has provided a strong endorsement for this proposal and we look forward to this meeting next summer. Many thanks to our colleagues for stepping up and offering to put this meeting together on relatively short notice. I hope that as many of you as possible will be able to attend this meeting. Having attended a Ludlow Research Group meeting last fall that visited the type Llandovery area, under the leadership of Jerry Davies, Dick Waters, Dave Schofield, and others, I know that many interesting new insights are emerging regarding the stratigraphic context of some of these GSSP sections.

For my own part, I will be attending the International Stratigraphic Commission Workshop on the GSSP Concept in Prague in late May-early June. I have been asked by the ICS Chair to present a summary of the current state of understanding of the Silurian GSSPs. Our understanding of the role of GSSPs in global stratigraphic correlation has evolved considerably since the 1970s and early 1980s and I plan to highlight some of our successes and challenges as a subcommission with regard to our GSSPs. While in Prague, Petr Storch and I plan to visit some Llandovery-Wenlock boundary localities to assess their potential for international correlation. In August, while in China I hope to have the opportunity to examine some of the graptolites that are emerging from a new Llandovery-Wenlock boundary section that has been proposed at the Sardinia as a possible GSSP candidate.

I hope you have a good year and I look forward to seeing you at some of the many meetings of Silurian interest that are coming over the next couple of years.

Mike Melchin, April 12, 2010

### 3. Annual Report of the Sub-Commission on Silurian Stratigraphy on 2009



#### International Commission on Stratigraphy Subcommission on Silurian Stratigraphy

##### 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 and palaeontologically important sites such as GSSPs

###### Goals

- Rationalization of global chronostratigraphical classification.
- Intercalibration of fossil biostratigraphies, integrated zonations, and recognition of global datums.
- Establishment of magneto- and chemo-stratigraphic scales.
- Definition of Stage boundaries and restudy of global stratotype sections.
- Correlation of Silurian rock successions and events, including marine to 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 new Subcommission elected for 2008-2012 there are twelve other Voting Members. The network of Corresponding Members have 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 2008-2012:

Chair:	Michael Melchin, Antigonish, Canada.
Vice-Chair:	Peep Mannik, Tallinn, Estonia
Secretary:	J. Verniers, Ghent, Belgium

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 an IGCP Project N° 503 entitled “*Ordovician Palaeogeography and Palaeoclimate*”. This project ended in 2009 and ISSS members are collaborating with ISOS members in the planning of a follow-up project proposal for IGCP.

#### 5. CHIEF ACCOMPLISHMENTS AND PRODUCTS IN 2009

Silurian Times No 16 was edited by the secretary in February 2009, 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.

The Silurian Field Meeting took place in Sardinia, Italy, June 4-11, 2009. The theme of the meeting was “Time and Life in the Silurian: an Interdisciplinary Approach”. This is in keeping with the recommendations of the voting members of the ISSS, as expressed at the 2007 business meeting in Nanjing, that a significant focus of future work of the Subcommittee should be chemostratigraphy of the Silurian, integrated with the biostratigraphy of graptolites, conodonts, chitinozoans and acritarchs and the study on the environment, climate and sea level changes. The meeting attracted approximately 50 Silurian specialists who presented a wide range of research results. The meeting was particularly successful in advancing one the stated goals of the ISSS, integration of data from different biostratigraphic, chemostratigraphic and lithostratigraphic perspectives, all focused toward a better resolution of Silurian time and understanding of the processes and events that operated in this interval. The meeting also resulted in the initiation of a number of new and expanded collaborations and research networks, as well as publication of the abstract volume and an excellent field guide and review of the current state of understanding of the Silurian of Sardinia. Another point of particular note for the ISSS was the presentation of the results of the preliminary study of a possible new GSSP candidate section for the Base of the Wenlock.

Plans are well under way for the next International Symposium on the Silurian System. The meeting location will be in St. Petersburg, Russia, with a field trip in the Subpolar Urals of Russia, which has an extremely well-exposed succession of Silurian Strata.

**{Editor's note: This report was submitted prior to the cancellation of plans for this meeting. See the announcement below concerning the new plans for a 2011 meeting in Ludlow, UK}**

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 will form 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), Homeric, Ludlow (Gorstian), and Ludfordian. Each of these GSSPs can be shown to be in need of refinement. As part of this the ISSS Chair and several other members attended a Ludlow Research Group field trip to the type Llandovery area, where the GSSPs for the Aeronian and Telychian occur. 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.

At the same LRG meeting it was resolved that the Ludlow Research Group, a primarily British group of geologists interested in the Silurian System, should strengthen its relationship with the ISSS, particularly in terms of communication of research activities.

The ISSS Chair sent a letter to the director of the BGS expressing the strong interest of the ISSS and the international stratigraphic community in the work of restudying the sedimentary basins that host the

Silurian GSSPs. The letter also expressed the hope that funding could be continued for this stratigraphic research.

ISSS members were involved in several other conferences in 2009 including a symposium on Paleozoic Seas, held in Graz, Austria, in September, 2009, the European Geosciences Union in Vienna, Austria April, 2009, and the final conference of IGCP 503, in Copenhagen in September, 2009. In addition, the North American Paleontological Conference had a special session sponsored by the ISSS and a field trip spanning the Silurian succession in the vicinity of the Cincinnati Arch.

## 6. CHIEF PROBLEMS ENCOUNTERED IN 2008

No major problems 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 2008

Income	
Carried forward from 2008	US\$400
ICS Allocation	US\$2000
Total	US\$2400
Expenditure	
ISSS field meeting expenses for Chair	US\$1000
ISSS field meeting expenses Secretary	US\$1400
<u>Balance</u>	<u>US\$ 0</u>

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

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.

Publication of Silurian Times Newsletter 17

Planning for International Symposium on the Silurian System, July, 2011.

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 planned for 2010.

Publication of the conference proceedings of the 2009 ISSS Field Meeting in Sardinia. This volume will be a special volume of the well-respected, refereed journal *Bollettino della Società Paleontologica Italiana*.

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

Participation in the publication of the research results of IGCP 503 and planning for followup IGCP project proposal.

Active participation in the ICS Workshop "The GSSP Concept", Prague, May 30-June 3, 2010.



The ISSS chair and some collaborators plan to make visits to Llandovery-Wenlock boundary sections in China and Czech Republic for preliminary assessment of their potential as a replacement for the current GSSP for this boundary (see restudy of the Wenlock Series GSSP below).

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 plan to focus 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 currently a serious weakness for the Silurian System.

## 9. BUDGET AND ICS COMPONENT FOR 2010

Contribution toward transportation, accommodation & registration of the Chair, Vice-Chair and Secretary to participate in the in the ICS Workshop The GSSP Concept, in Prague, May 30-June 3, 2010.	\$4000.00
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Since the ISSS has done pioneering work in the area of restudy of previously ratified GSSPs (see below), it is particularly important that members of the ISSS executive participate in this workshop, whose focus is The GSSP Concept.

**Total requested from ICS:**  
**\$4000.00**

### 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 (2005-2009)

Over the period of 2005-2009 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 2009". In addition to those, the following are the most significant accomplishments of the past five years.

1) The Silurian Field Meeting of the SSS was held in Gotland, Sweden between August 15 and 22, 2005. A three day symposium followed by five days excursion was organized by M.E., Eriksson, M. Calner, and L. Jeppsson (Lund University and support of the Swedish Geological Survey). The field guide and the abstract book were published in the volume *"The Dynamic Silurian Earth"*. In: Eriksson, M.E., Calner, M. (Eds.), *Field Meeting of the Subcommittee on Silurian Stratigraphy 2005, Gotland, Rapport och meddelanden-Sveriges Geologiska Undersökning vol. 121, pp.1-99*.

2) 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. By the middle of March 2006 all titular members have voted in favour of the proposal of Mike Melchin for the base of the Silurian at Dob's Linn. It has now been ratified by ICS and IUGS and a final report has been published in the September, 2008 issue of Episodes.

3) Regarding the restudy of the base of the Wenlock Series. The working group to restudy the Base of the Wenlock Series (base of Sheinwoodian Stage) was led by David Loydell, looked at potential GSSP sections in the Czech Republic and Wales, as possible alternatives to the current GSSP in England. The primary marker for the base-Wenlock was a graptolite, but the GSSP in England is notably poor in

allowing exact determination of their ranges. Recent evidence has shown that the current GSSP does not coincide with the base of the *Cyrtograptus centrifugus* Biozone, as was supposed when the GSSP was defined. It has been suggested to retain the GSSP location in England but revise the level of the GSSP to coincide with a conodont event -- the Ireviken conodont datum 2. The correlation between this level and the graptolite biozonation is a matter of some controversy. It is either approximately correlative with the base of the lower *murchisoni* graptolite Biozone (instead of the current *centrifugus* graptolite zone), or else a level high within the *murchisoni* graptolite Biozone. Alternatively, another GSSP locality with a precise base of the *Cyrtograptus centrifugus* Biozone could be chosen (e.g., potential sections in Great Britain or the Czech Republic), but this process would be quite lengthy. The report of this work at the Silurian Field Meeting in Gotland, in August, 2005, was discussed over the winter and spring, 2006. Most voting members appreciated very much the amount of work by the working group and especially the leader of the group. But most felt that for the moment no good alternative for the previous GSSP can be proposed. It was decided not to propose a new GSSP and stick for the time being to the old GSSP, although it had many shortcomings, until new studies can propose a better alternative. This time consuming study could however not be completed before the deadline of the ISC, ending at the International Geological Congress in Oslo summer 2008.

At the 2009 Silurian Field Meeting many of the ISSS members expressed their desire to continue to search for a new GSSP for the Base of Wenlock to replace the current one. Those members felt that it would be in the best interest of stability to find a new GSSP whose level coincides with the base of the *Cyrtograptus centrifugus* Biozone. Other members expressed the view that, with additional study, it may be that the current GSSP can be shown to provide a high level of biostratigraphic resolution based on its conodont faunas and that it would be in the best interest of stability to keep the current location and level. This is a matter of ongoing research and discussion for the Subcommittee.

4) An International Conference on the Silurian System was held in Nanjing, China, in June-July 2007, hosted by the Nanjing Institute of Geology and Palaeontology. 22 talks and posters were presented on the Silurian and three excursions to the extensive Silurian outcrop areas of South China with more than 70 participants impressed the participants by the good exposures and the extensive work that was done in these sections. Conference proceedings were published in a special issue of Acta Palaeontologica Sinica.

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

#### **OBJECTIVES AND WORK PLAN FOR NEXT 4 YEARS (2010-2013)**

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:

Silurian Field Meeting in 2013, location to be announced.

As also noted above, we plan to collaborate 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. It is our objective to complete integrated biostratigraphic, chemostratigraphic, and sequence stratigraphic of each of the GSSPs. At the present time, each of these GSSPs has a significant level of imprecision in its definition for the purposes of high resolution stratigraphic correlation. It is our hope that these restudies will increase the precision with which the GSSPs can be defined and correlated, as has been the case with the restudy of the Base of the Silurian. If not, this work may provide a compelling rationale for seeking a replacement section and point for one or more of the current GSSPs.

We will investigate the establishment of data-bases which would bring together and make available information from all sources associated with the Silurian researchers. Associated with this will be the development and expansion of the Thematic Working Groups: for example, searching for and interpreting data from all sources relevant to reconstructing the palaeobiogeography or the climate of one or more specific time-intervals.

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

**APPENDIX [Names and Addresses of Current Officers and Voting Members ISSS, 2008-2012]***Subcommission officers*

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

**Vice Chairman:** Peep Mannik, Institute of Geology at Tallinn University of Technology

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#### 4. Report of the Business Meeting of the ISSS in Sardinia on Saturday 6 June 2009 15h00-16h45

Nine titular members (D. Holloway, Jin Jisuo, M.E. Johnson, J. Kříž, P. Männik, M.J. Melchin, P. Štorch, J. Verniers, Zhan Renbin) together with 23 other participants of the conference are present at the business meeting.

1. At the start, the chairman of the ISSS, Mike Melchin (MM) expresses his sincere thanks to the organizers for all the time and efforts they put in the preparation the field meeting of the ISSS. He appreciates the wonderful job they did in the organization of the venue both scientifically, socially and culturally.

2. Report on previous meeting (Oslo, August 2008).

Amongst the points discussed at that meeting, and fully explained in the yearly report to the ISSS (see *Silurian Times* 16), he formally had thanked the previous Chair and Vice-chair of the ISSS, Rong Jiayu and T. Koren, for their long, dedicated support and productive chairing of the ISSS. He had also thanked R. Cocks for his long and vast contribution to the work of the ISSS since many years.

3. Work on GSSPs (other than base Wenlock)

MM contacted the British Geological Survey (BGS) last summer and will do in the next fall. The BGS runs since a few years and in the years to come projects to produce new geological maps in Wales and the Welsh Borderland, the classic area for the Silurian, the home of its chronostratigraphical names and the area where six of the seven GSSP's of the Silurian series and stages are located. In a letter to the director of the BGS he emphasized the importance of their projects for the ISSS and he gave them the full support of the ISSS in these projects. The ISSS is most interested in these projects because many of these GSSP's might need a revision (as well for the litho- and biostratigraphy as for the sequence and chemostratigraphy), which could benefit from the new fieldwork, where new sections and fossil localities will be studied. Redefinitions of some of the lithostratigraphical units are expected. It would not be a good idea that the ISSS would work on the same job independently. MM is engaged with the BGS for the chemostratigraphical part. The members of the meeting agree with this proposed task of the ISSS.

4. Progress on the base of the Wenlock

The chairman summarizes the problem (as can be followed in the past *Silurian Times*). The restudy of the GSSP for the base of the Wenlock Series was initiated following discussion at the business meeting of the ISSS in Orange, New South Wales, in July 2000 and subsequent support by voting members by correspondence, it was agreed that the GSSP for the base of the Wenlock was in urgent need of restudy. Evidence showed that the current GSSP did not coincide with the base of the *Cyrtograptus centrifugus* Biozone, as was supposed when the GSSP was defined. Jeppsson (1997, p. 95) stated that the base of the Wenlock Series 'occurs within a few centimeters from the base of the Upper *Ps. bicornis* Zone.' The base of this conodont biozone equates with Datum 2 of the Ireviken Event (see Jeppsson 1998, fig. 3) marked by the LADs of several conodont taxa.

David Loydell was asked to serve as 'leader and organizer' of a working group to undertake this work. Regular progress reports have appeared in *Silurian Times* (Loydell 2001, 2002, 2003, 2004). The primary marker for the base-Wenlock was the graptolite *Cyrtograptus centrifugus*, but the GSSP in England is notably poor in allowing exact determination of their ranges. It has also been suggested to retain the GSSP location in England but revise the level of the GSSP slightly to coincide with a conodont event -- the Ireviken conodont datum 2, which coincides approximately with the base of the lower *murchisoni* graptolite biozone (instead of the current *centrifugus* graptolite zone). Alternatively, another GSSP locality with a precise base of the *Cyrtograptus centrifugus* Biozone could be chosen (e.g., potential sections in Great Britain and the Czech Republic), but this process was to be quite lengthy. David Loydell looked at potential GSSP sections in the Czech Republic (Malá Chuchle-Vyskočilka) and Wales (Banwy River

section), as possible alternatives to the current GSSP in England, but this lengthy study led to no positive result due to overheating by a dyke in the former proposed section and the presence of a faulted contact just at the boundary in the latter.

The report of David Loydell at the Silurian Field Meeting in Gotland, in August, 2005, was discussed over the winter and spring, 2006. Most voting members appreciated very much the amount of work by the working group and especially the leader of the group. But most felt that for the moment no good alternative for the previous GSSP can be proposed.

It was decided not to propose a new GSSP and stick for the time being to the old GSSP, although it had many shortcomings, until new studies can propose a better alternative. This time consuming study could however not be effectuated before the deadline of the ISC, ending at the International Geological Congress in Oslo summer 2008. However after the publications by Mannik (2007a and 2007b) presented at the ISSS Meeting in Nanjing 2007, it became more clear that the level of the actual golden spike estimated close to the level LAD 2 corresponds with an even higher level: high in the *murchisoni* biozone.

Since then the following ambiguity surged: some researchers continued to use as base of the Wenlock the intended index fossil: i.e. the base of the *centrifuges* biozone; while others used the base of the *murchisoni* biozone, which is incorrect after the publication of Mannik (2007a, b.), while others used the conodont level LAD 2. The ISSS cannot accept this ambiguity. Commission boundaries are official and should be followed in official documents, while scientists on their own can use their own boundaries if they argue why their option is different.

Several speakers at the meeting here favoured stability in the stratigraphy and asked to follow a procedure as conservative as possible. A straw vote was proposed by the chairman. "No formal decision can be taken regarding changing the base of the Wenlock, pending further research." The straw vote was unanimous in favour, with no abstentions. Either way a change of GSSP or of the index fossil group and species will be necessary. The most conservative solution leaves only two possible options:

(1) Either keep the GSSP and redefine the index fossil marking the golden spike (not a graptolite, but a conodont), implying additional work at the GSSP.

(2) keep the intended index fossil group and species: i.e. the base of the *Cyrtograptus centrifugus* Biozone and look for another GSSP. This implies the study of other sections which would yield biozonation with graptolites, conodonts, chitinozoans, and chemostratigraphy and more time. Several possible sections are now under study or could be studied more in detail. From Loydell's report we know "that two sections in Wales, within the Dyfnant Forest and in the Trannon River, are likely, but not guaranteed, to expose the base of the *centrifugus* Biozone. Test samples indicate that they both yield well preserved chitinozoans. Both sections, being basinal, are thick and their study would require years of work."

The general agreement in the meeting was to keep as long as no decisions has been taken and voted upon, for a new species or a new GSSP, that one should stick to the intended base of the Wenlock: i.e. base of the *Cyrtograptus centrifugus* Biozone and that the present GSSP is suspended for the moment. The chairman will ask information at the ICS or the right strategic procedure to follow, not to be in violation with any ICS rule.

5. A new section for the base of the Wenlock in China is proposed at the meeting via a poster. It has a continuous graptolite biozonation through the boundary. More research is asked for palynomorphs and chemostratigraphy. Since for the following excursion is in 2011 and the next field meeting is scheduled in 2013, too long from here, it is proposed to check possibilities for the Llandovery-Wenlock boundary Working Group to go and visit the section in the near future.

6. Work on integration of biostratigraphy, chemostratigraphy, sequence stratigraphy and chronostratigraphy.

The chairman can easily conclude from that this goal of our subcommission is strongly pursued by the members of our subcommission in their research. This is excellently demonstrated by the presentations at this meeting.

7. Need for new radiometric dates in Silurian

For the preparation of the next Geological Timescale book 2010 new methodological constraints are put on previous radiometric age dating. Many Silurian absolute ages used in the 2004 chapter will not be accepted any more. Only two dates will be kept: both Telychian. One assigned to the *crenulata* biozone might need to be resampled and redated, because the attribution to the biozone happened before the splitting of that biozone and the exact position of the bentonite used was not published (there are several bentonites in that quarry). The chairman asks the members to communicate to him as much as possible, new dates recently published, in press or in prep. L. Sherwin announces the project the Geological Survey of Australia (New South Wales) where new biostratigraphy and new radiometric ages are being produced.

8. ICS GSSP workshop 2010

An open workshop is announced “Prague 2010 - ICS Workshop: The GSSP Concept” at the Charles University, Prague, Czech Republic, between 30 May and 3 June 2010. Members of the full commission of ICS (ICS executive officers and chairs of all subcommissions) are expected to attend. Vice-chairs and secretaries of all subcommissions are encouraged to attend. All other members of subcommissions and additional members of the stratigraphic community with significant contributions to make are also welcome. The agenda contains amongst others:

1. The GSSP Concept: its success, its shortcomings, problems that have arisen, difficult boundary issues remaining.
2. The exemplary GSSP proposal – essential components, definition and correlation; how best to present a GSSP proposal.
3. Leadership of ICS subcommissions: ensuring progress on GSSPs; addressing difficult boundaries; managing conflicts ...
4. Future of ICS and its role in IUGS.
5. Dual versus single stratigraphic classification of geologic time and time-rock units.
6. Dual usage of “Stage”.
7. Integration of varied stratigraphic records and calibrated ages with the International Chronostratigraphic Chart.
8. Revisions to ICS statutes.

The Chairman, and possibly the vice-Chairman and secretary plan to attend the workshop.

9. IPC 2010 London

The organizing committee of the 3th International Paleontological Conference, London (28 June - 3 July 2010), had requested early this year proposals for symposia/workshops convened by the Stratigraphical Subcommissions. The initial proposal on “Integrated late Silurian (Ludlow-Přídolí) stratigraphy of the Prague Synform – a new project introduction” has been redrawn, because it needed more preparation time.

10. Silurian Symposium 2011

The next Silurian Symposium will be organized by Tania Koren, Anna Antoshkina, Peep Mannik and collaborators somewhere between 10 and 31 July 2011 (the best period for the fieldwork). It will consist of two parts: presentation of talks and posters to be held in St-Petersburg, followed by a field excursion in the Subpolar Urals (as announced in Silurian Times 16). Peep Mannik presents the excursion program. The Silurian in the Kozhym River area, a national park area, has the best known sequences in the Timan-subpolar Ural region. The 1200m thick Silurian sequence with nine formations in a folded area will be shown in the Balban’yu River area, the Yarenej Shor area, the Durnayu River area and the Syv’yu River area. The organizing committee has already done extensive fieldwork to prepare the excursion.

11. New corresponding members

At the meeting six new corresponding members are proposed and accepted:

Brad Cramer (U.S.A.); Bing Huang (P.R.China); David Ray (U.K.); Lawrence Sherwin (Australia); Peng Tang (China); Zhao Wenjin(China).

12 Silurian Times update

The chairman asks the members to announce to the secretary as much as possible (around New Year each year) their projects, performed and future plans, on Silurian research. The cover of the next Silurian Times will receive a face lift thanks to a proposal of Brad Cramer. The participants of the Sardinia meeting will be added to the list of the ISSS interested members, who all will be able to report to the next Silurian Times and receive a copy via email.

13. Any other business

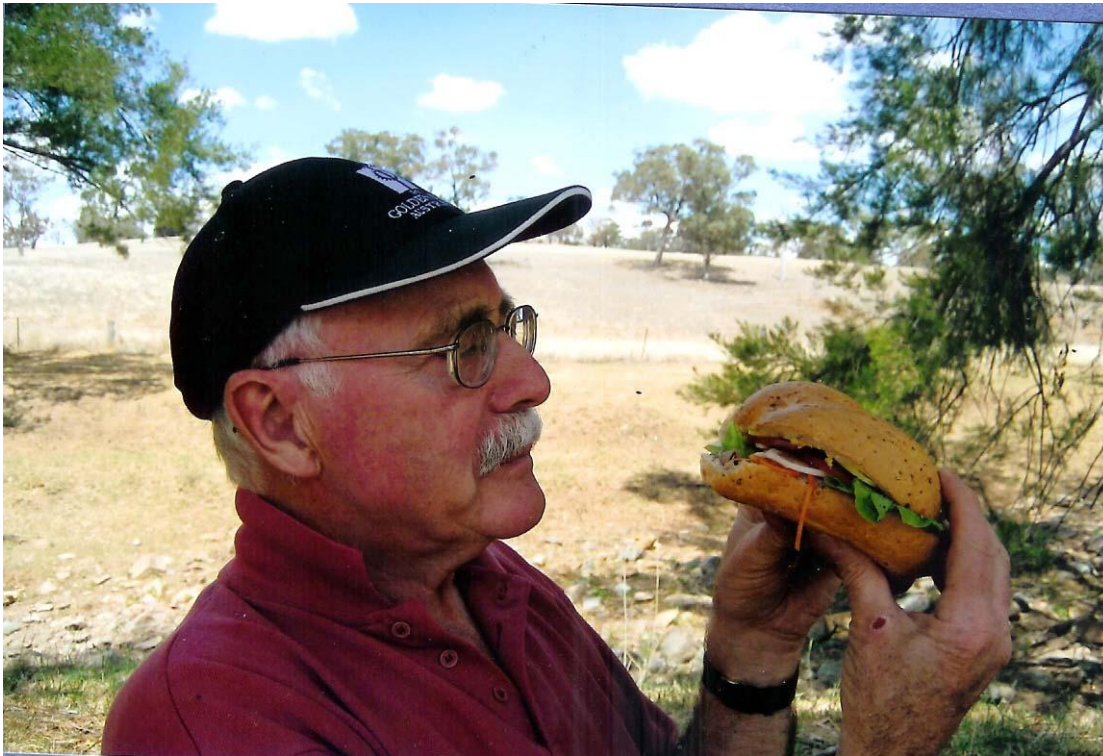
The chairman asks members to think about possible areas to visit in the ISSS Field meeting of 2013. All proposals are welcome.

A member asks to refer in the announcement of coming meetings to use months instead of seasons (summer, etc.) which might differ between the northern and southern hemisphere.

Mike Melchin, Chairman,  
Peep Mannik, Vice-Chairman,  
Jacques Verniers, Secretary

## 5. Obituary

Richard **Barrie Rickards**, June 12, 1938 - November 5, 2009.



Barrie Rickards, Professor Emeritus of Palaeontology and Biostratigraphy in the Department of Earth Sciences, University of Cambridge, died in Addenbrookes Hospital in Cambridge (UK) after battling multiple myeloma and associated ailments for over 2 years. Friends and colleagues will not be surprised to hear that Barrie was cheerful, positive, dynamic, hard-working and enthusiastic right to the end. In less than 24 hours after his final admission to hospital he was unexpectedly released from his suffering. His huge funeral in the chapel of Emmanuel College was attended by over 400 people, including family, friends and colleagues from all walks of life, with nearly 300 anglers: a testament to the respect in which he was held.

The obituary in *The Times* showed Barrie in fishing mode, but his geological contribution was enormous, particularly in the field of graptolites. He will long be remembered in Silurian circles as one of the world's leading experts on graptolites, as well as being a Titular Member of the Subcommittee on Silurian Stratigraphy from its inception in 1974 until he resigned in 1981, and was also Chairman of the Ordovician-Silurian Boundary Working Group over the same period.

Barrie spent his formative years in Hook, a little village on the eastern fringe of Leeds in Yorkshire. His autobiography of his childhood, "Fishers on the Green Roads", show how his experiences of roaming the countryside inspired his life. His talent for long distance running kept him extremely fit. Although his primary school study was neglected, he excelled when studying subjects more interesting to him. Geology combined the outdoors he loved with academic rigour. Barrie's degrees were: BSc (Hull, 1960), PhD (Hull, 1963), MA (Cambridge, 1969), ScD (Cambridge, 1977, one of the youngest recipients) and DSc (Hull, 1990). His PhD fieldwork included mapping of the largely Silurian rocks of the Howgill Fells in northern England, and he speedily recognised that the only way of sorting out the complex deeper-water rocks there, mostly turbidites, was with the aid of graptolites; thus he became as much a palaeontologist as a sedimentologist. As his academic reputation grew, he held appointments at University College London, the University of Cambridge as Oliver Bulman's research assistant, the British Museum (Natural History) in London and as a lecturer at Trinity College Dublin with his life-long friend and colleague, Charles Holland. He succeeded Bertie Brighton as Curator of the Sedgwick Museum, University of Cambridge in



1969 and stayed there for the rest of his life. He and Bulman made a formidable team and, with Bulman's passing, Barrie continued the expert work on graptolites.

His meticulous scientific skills made him a very good curator: skills he passed onto other curators with whom he came in contact. He published over 275 papers, many substantial monographs, and 5 books on graptolites and related subjects. This output was dwarfed by another love of his life: angling. His influential fishing legacy is over 30 books and more than 800 articles, on all different types of angling and history. Wherever he was in the world, he would take an opportunity to fish if at all possible in all types of waters for all types of fish. He spent vacations fishing in Canada, Australia, Egypt, the Amazon, as well as rivers, lakes and the sea around Britain. Weekends, evenings, early mornings one would often see him on one of the nearby Fens waterways or the River Cam. He was a consultant for the fishing tackle firm, Shakespeare, in recognition of his angling abilities, his common sense approach and impeccable reputation. Barrie was known as the guru of pike fishing in the UK as well as a spokesperson for angling in general. His geological and fishing expertise melded together in his campaign on environmental issues, particularly drainage policy and management of lakes and rivers. Barrie was a University of Cambridge scientific adviser to the Anglian region of the Environment Agency for 1996-2002.

Barrie became a Fellow of Emmanuel College in 1978, Professorial Fellow in 2000 and Life Fellow in 2005. He set up his college room as a geology teaching office where he taught his supervision students with his infectious enthusiasm. He also taught geology students at Christ's and Girton Colleges. He immersed himself in Emmanuel College life and responsibilities. He served as University Proctor for 1983-5, served on the Council of the Geological Society of London, the Yorkshire Geological Society, the Palaeontological Association, and was an active member of the Ludlow Research Group, and the British and Irish Graptolite Group (BIGG). He was instrumental in establishing the BIGG to which much of his research literature has now gone. For over 20 years he was a consultant on Silurian strata for oil companies. For his substantial contributions, Barrie was awarded the Murchison Fund (1982) and the Lyell Medal (1997) by the Geological Society of London of which he was a Chartered Geologist, and the John Phillips Medal (1988) by the Yorkshire Geological Society London, in recognition of 'the major contributions to our understanding of the Lower Palaeozoic' and 'the brilliance and profundity of his graptolite research'. He served on many committees, tirelessly giving his experience and expertise in whatever field where he could assist.

He was an excellent field geologist: very often his legendary "golden hammer" found graptolites in rocks hitherto considered barren. He was delightful company, as much for his mirthful enthusiasm as for his awesome knowledge and experience, particularly of Silurian rocks and graptolites. He used the rapid evolution of graptolites to date and correlate Ordovician and Silurian strata with precision. Many of his papers were on stratigraphy and correlation. As a contemporary, Robin feels privileged to have been a colleague of Barrie early in their careers and later as members of the teams working on the type Llandovery and Wenlock Series, the Ordovician-Silurian Boundary, British Silurian correlation syntheses and other projects. All the authors had special long-standing academic and personal friendships with Barrie.

Barrie was at the fore-front of innovative graptolite research for many years, developing and refining the zonal systems, working on graptolites from all ages, Cambrian to Carboniferous, and inspiring numerous postgraduate students. As a result he was in great demand worldwide. He was one of the pioneers in the study of graptolite structure through use of the scanning electron microscope: SEM work with Peter Crowther led to the recognition of 'cortical bandages'. His 1984 work on *Psigraptus jacksoni* Rickards & Stait from Tasmania demonstrated, for the first time, pyritised zooids, some in 3D. Barrie's work on Victorian graptolites with Mike Garratt established that there are two Baragwanathia floras in Victoria, one Late Silurian and the other Early Devonian, shocking conservative members of the palaeobotanical establishment. He was instrumental in demonstrating the hemichordate nature of graptolites and their close relationships with extant rhabdopleurans. His work on graptolite hydrodynamics started with simple

models in the Emmanuel College swimming pool with Sue Rigby before progressing to wind tunnels and computer modelling, some of it with his (now deceased) son Jeremy. His study of the enigmatic South African Ordovician *Promissum pulchrum* (previously considered a primitive plant) material led to the realisation, with Dick Aldridge and Johannes Theron, that this organism was an exceptionally preserved conodont animal, consequently revealing the complete anatomy of this primitive vertebrate and exposing an in situ assemblage of conodont elements. Work with Peter Durman (2006) focused on the very early evolution of Cambrian graptolites, and with Tanya Koren' important Silurian Russian material was described. With Andrew Sandford he documented Silurian graptolites from the Melbourne Trough. His academic work was prolific and substantial.

Barrie first visited Australia in 1977 as a guest lecturer of the Australian Vice-Chancellors Committee, and he clearly discerned that graptolite research in Australia was a fertile field, as his ensuing publications immediately showed. There were very few publications on Tasmanian graptolites prior to 1978 but, following his 1977 visit to Hobart, over the next 15 years Barrie played a leading role in research and publications on Tasmanian Ordovician, Silurian and Devonian graptolites, some of them new species. He made numerous subsequent trips to Australia and published extensively on NSW, Victorian, Tasmanian and Queensland faunas, much of this work being directed at documentation and description of graptolite faunas and establishing their biostratigraphic and palaeoenvironmental value. His graptolite expertise, coupled with his incredible skills in graptolite collecting (the golden hammer) and observation, made him the powerhouse of this research. During a visit to Wollongong in 1988 he first saw and realised the importance of faunas from Quarry Creek, west of Orange, NSW; he subsequently revised and described these and other important graptolite faunas from (for example) Yass and Wellington, as well as the diverse, well-preserved dendroid faunas from particularly Four Mile Creek near Cadia and Cotton Hill near Forbes. It could certainly be argued that his publications on Australian graptolites collectively surpassed the output on Australian graptolites of the Victorian greats T.S. Hall, R.A. Keble, J.W. Harris and D.E. Thomas.

Barrie was a great communicator and a great field geologist. He interacted with small children, tradesmen, executives or highly intelligent colleagues at the right level with his soft-spoken accent. His students loved him as he encouraged them to think but led them gently down the right path. His knowledge was astounding – whether it was structure or tectonics or geochemistry as well as other areas of palaeontology and sedimentology. He loved the outdoors and appreciated Nature. He had an incredible eye for detail and observation, and was meticulous in reproducing it, which is reflected in his graptolite drawings and his own landscape sketches.

A Yorkshireman by both birth and character, Barrie rose to the top of his profession by dint of hard work, efficiency and brilliant research. He never took to the computer, but he did argue successfully for Emmanuel students to have access to a computer in his college office, and championed the computerisation of Sedgwick Museum records. It is impossible not to mention his trademark green Morris Minor van, a familiar part of his Cambridge and fishing life. He could be confident and forthright, but was more naturally gentle and shy. His friends will remember him for his integrity, honesty, and an infectious sense of humour.

Barrie had what can only be described as a fulfilling life. He is deeply missed by his partner Mandy Lyne, step-daughters Rebecca and Louisa, and granddaughters Fern and Alice. His death also leaves a huge gap for the many friends and geologists who valued his scientific expertise and their friendship with him. Vale Barrie.

Tony Wright and Penny Williamson, University of Wollongong

Max Banks, University of Tasmania

Robin Cocks, Natural History Museum, London, UK

Nigel Woodcock & Alex Page, University of Cambridge, UK

Below we list only those papers (not including conference abstracts) written on Australian faunas and with Australian colleagues which illustrates his strong affinity with Australia.

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## 5. Reports of Meetings in 2009

### SILURIAN FIELD MEETING IN SARDINIA, ITALY, IN 2009.

“Time and life in the Silurian: a multidisciplinary approach”. Petr Storch, Enrico Serpagli and



#### Annalisa Ferretti announce the ISSS field-meeting in **Sardinia (Italy), June 4-11 in 2009**

The International Subcommission on Silurian Stratigraphy Field-Meeting 2009 was held in Sardinia (Italy). The meeting consisted of three days of scientific communications in the seaside village of Villasimius, in the southeastern part of the island, followed by a four days field trip in southern Sardinia.

More than fifty scientists from fifteen countries attended the meeting. The scientific sessions were filled with talks dealing on any aspect of Silurian stratigraphy and palaeontology; the poster session included 18 posters. One afternoon was dedicated to the ISSS business meeting.

A proceedings volume including eight papers will be published in late spring in a special issue of *Bollettino of the Società Paleontologica Italiana*. Pdf file of all contributions will be downloadable from the meeting web site ([www.unica.it/silurian2009](http://www.unica.it/silurian2009)).

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

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

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

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

*Index of the volume:*

## Foreword

- P. STORCH, A. FERRETTI, C. CORRADINI - Enrico Serpagli, celebrating his 44<sup>th</sup> Silurian-research birthday  
 S. BARCA - The Silurian of Sardinia (Italy): more than one and half century of researches  
 A. FUNEDDA, G. OGGIANO - Outline of the Variscan basement of Sardinia  
 G. OGGIANO, P. MAMELI - Silurian and its surroundings in the inner nappes of Sardinian Variscides: Lithostratigraphical evidence from metamorphosed deposits  
 C. CORRADINI, A. FERRETTI - The Silurian of the External Nappes (southeastern Sardinia)  
 C. CORRADINI, M.G. CORRIGA, A. FERRETTI, F. LEONE - The Silurian of the Foreland Zone (southwestern Sardinia)  
 A. FERRETTI, P. STORCH, C. CORRADINI - The Silurian of Sardinia: facies development and palaeoecology  
 A. FERRETTI, G. OGGIANO, C. CORRADINI, P. STORCH - Silurian Palaeogeography of northern Gondwana: where was Sardinia at that time?  
 P. STORCH, S. PIRAS - Silurian graptolites of Sardinia: assemblages and biostratigraphy  
 M.G. CORRIGA, C. CORRADINI, A. FERRETTI - Silurian conodonts from Sardinia: an overview  
 M. GNOLI, P. SERVENTI - Silurian nautiloid cephalopods from Sardinia: the state of the art  
 J. KRIZ - The upper Silurian Bivalvia dominated palaeocommunities succession of southwestern Sardinia – correlation with Perunica and the peri-Gondwanan regions of Europe  
 P. PITTAU, M. DEL RIO - Chitinozoan assemblages and biostratigraphy of the Silurian of Sardinia  
 M. GNOLI, V. PERRIER, P. SERVENTI - The state of researches on Silurian Sardinian Crustacea  
 C. CORRADINI, M. DEL RIO, M. GNOLI, P. PITTAU - Minor fossil groups in the Silurian of Sardinia

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

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

*Index of the volume:*

## Foreword

- C. CORRADINI, A. FERRETTI, P. STORCH - The Silurian of Sardinia: introduction to the field trip  
 S. PIRAS, P. STORCH, P. PITTAU, M. DEL RIO - The Lower Graptolitic Shales at Rio Minderra and Rio Brabaisu-Rio Ollastu confluence (Rio Ollastu area, Sarrabus, SE Sardinia)  
 P. STORCH, S. PIRAS, M.G. CORRIGA- Wenlockian graptolites and the Lower Graptolitic Shales-Ockerkalk transition East of Lantini Tunnel near Ballao (SE Sardinia)  
 S. PIRAS, F. PASCHINA - The Lower Devonian Upper Graptolitic Shales in the Sa Ruinosa Section (SE Sardinia)  
 P. STORCH, S. PIRAS, P. PITTAU, M. DEL RIO - The historical section of Goni (Lower Graptolitic Shales, SE Sardinia)  
 P. STORCH, S. PIRAS - Lower Telychian graptolite fauna in Sedda de S'Ortu Section (Lower Graptolitic Shales, SE Sardinia)  
 C. CORRADINI, A. FERRETTI, M.G. CORRIGA, E. SERPAGLI - The reference section of the Sardinian Ockerkalk: the Silius Section  
 C. CORRADINI, A. FERRETTI, M.G. CORRIGA, E. SERPAGLI - Loboliths (crinoids) and conodont biostratigraphy of the Genna Ciuerciu Section (SE Sardinia)  
 F. LEONE, A. LOI, G.L. PILLOLA, P. STORCH - The Late Ordovician (Hirnantian) deposits in the Domusnovas area (SW Sardinia)  
 P. STORCH, S. PIRAS - Lowermost Silurian graptolites in Monte Cortoghiana Becciu (Genna Muxerru Formation, SW Sardinia)  
 G.L. PILLOLA, A. FERRETTI, M.G. CORRIGA, C. CORRADINI - Highly tectonized Silurian and Lower Devonian sediments at Funtanamare (SW Sardinia)  
 A. FERRETTI, C. CORRADINI, J. KRIZ, S. PIRAS, E. SERPAGLI - The Perd'e Fogu outcrop: a classical exposure of "Orthoceras limestone" in the Fluminimagiore area (SW Sardinia)

**3. 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](http://www.unica.it/silurian2009)).

Copies of the three volumes are still available. The complete set of three volumes cost 45 € (+5 € for shipping expenses). Each volume costs 20 €.

For orders and payment details please contact [silurian2009@unica.it](mailto:silurian2009@unica.it)



Group photo at the conference in Villasimius Sardinia.



Group photo during the excursion when visiting the old port of Porto Flavia, a mineral charging installation, excavated in the mountain with access to boats in the sea.







6.2. Paleozoic Seas Symposium (14-18<sup>th</sup> September 2009, Graz, Austria)



The Paleozoic Seas Symposium held in Graz last autumn was attended by 30 participants coming from 11 different countries who performed oral or poster presentations on their recent studies related to stratigraphy, paleontology, paleoecology, geochemistry, and other topics. Additionally to the scientific program, single day excursions to Devonian sections of the Graz Paleozoic and the Carboniferous sequence of the Carnic Alps took place during the second half of the meeting. As far as concerns presentations related to Silurian topics, contributions dealt with Early Palaeozoic climate changes (e.g. O/S Icehouse period in Baltoscandia), the Standard Zonation concept of Silurian conodont zones, pelagic ostracods, Silurian to Devonian brachiopods (discussion on the genus *Howellella*) and a critical review on stable isotopes signals of brachiopod shells from Gotland. Other contributions stressed the radiation of Blastoidea, microbial carbonates of Gotland, microconchids of Austria, conodonts of the Carnic Alps and other microfossils from Eastern Karakoram. The Abstract volume can be downloaded via: [http://www.uni-graz.at/thomas.suttner/PDFeditorials/PSS\\_Abstract%20Volume.pdf](http://www.uni-graz.at/thomas.suttner/PDFeditorials/PSS_Abstract%20Volume.pdf)

Due to the success of this meeting a second one is scheduled for 2011; meeting venue: Beroun (Czech Republic). For further information please contact Stepan Rak (deiphon@geologist.com). We hope to see some more *Panderer* joining the upcoming symposium. Topics will concern ocean modelling, paleoclimate, paleobiogeography, global biotic crisis, geochemistry and stratigraphy of the Iapetus, Panthalassic Ocean, Paleo-Tethys, Rheic Ocean, Tethys or the Tornquist Sea.

**6. 1. ANNOUNCEMENT OF NEXT ISSS MEETING:**

**Siluria Revisited: International Subcommittee on the Silurian  
System Conference and Field Meeting 2011  
FIRST CIRCULAR**

Dates for the 2011 meeting have now been finalised. Preliminary details of the meeting are below. We will endeavour to keep costs to a minimum to enable as many interested scientists as possible to attend. Costs (registration, field trips, conference dinner, etc.) and abstract deadlines will be indicated in the 2<sup>nd</sup> circular. This circular is primarily to publicise the dates and location of the meeting.

**Aims:** The Silurian System is the focus of a considerable amount of research interest at present encompassing climate change, extinction and radiation events, isotope excursions, hydrocarbon source rock generation and much more, all of which need to be underpinned by detailed stratigraphical, sedimentological, geochemical and palaeontological studies and accurate radiometric dating.

The aim of the conference is to enable researchers to present their recent research on the Silurian System; the field trips are intended to enable a new generation of workers on the Silurian System to visit the GSSPs for those series and stage boundaries that occur in Wales and the Welsh Borders and to visit other sites that have been the subject of recent published and unpublished study.

**Dates:** Saturday 9<sup>th</sup> July-Friday 15<sup>th</sup> July

**Organizers:** David Loydell, David Ray, Brad Cramer, Anthony Butcher, David Schofield, Jerry Davies, Dick Waters, Jan Zalasiewicz

**Pre-conference field trip:**

This will be based in the Llandovery area, enabling examination of the GSSPs for the base of the Aeronian and Telychian stages, together with other informative sections in the region.

Saturday 9 <sup>th</sup> July	Arrive Llandovery Evening lecture introducing pre-conference field trip
Sunday 10 <sup>th</sup> July	Fieldwork in Llandovery area, including base Aeronian and base Telychian GSSPs
Monday 11 <sup>th</sup> July	Fieldwork in mid Wales and Welsh Borders en route to Ludlow

**Numbers are likely to be limited to 30.**

**Conference:**

This will take place in the Ludlow Conference Centre. Address is Lower Galdeford, Ludlow SY8 1RZ ([www.ludlowconferencecentre.co.uk](http://www.ludlowconferencecentre.co.uk)). This has recently changed its name from the Bishop Mascall Centre, a name that many locals still use.

Monday 11 <sup>th</sup> July	evening: registration
Tuesday 12 <sup>th</sup> July	conference presentations p.m. business meeting of ISSS evening: conference dinner at Ludlow Castle (this will be preceded by a tour of the castle)
Wednesday 13 <sup>th</sup> July	conference presentations lecture introducing post-conference field trip

There will also be the opportunity during the conference to visit both Ludlow Museum and the Ludlow Museum Resource Centre, both of which have holdings of fossils mostly from the Welsh Borders.

### **Post-conference field trip:**

Transport will depart from Ludlow each day to examine GSSPs and other important localities in the Welsh Borders and English Midlands.

Thursday 14 <sup>th</sup> July	mostly Wenlock localities, including GSSPs for base Wenlock and base Homeric
Friday 15 <sup>th</sup> July	mostly Ludlow localities, including GSSPs for base Ludlow and base Ludfordian

**Numbers are likely to be limited to 50.**

### **Accommodation:**

The cost of the pre-conference excursion will include accommodation.

For the conference and post-conference excursion, Ludlow offers a wide variety of accommodation.

Delegates are responsible for booking their own accommodation unless they choose to stay at the Ludlow Conference Centre (see below). Ludlow is not a large town and much of the accommodation available is within easy walking distance of the Ludlow Conference Centre in Lower Galdeford. The website <http://www.ludlow.org.uk/> has a comprehensive list of accommodation. For those fancying a very short journey to/from the conference dinner there is self-catering accommodation at the Castle House Lodgings (<http://www.castle-accommodation.com/>), although note that bookings are for either a week or four nights (midweek booking = Monday to Thursday).

Basic accommodation (i.e. with sinks in rooms, but with shared toilets, bathrooms/showers) is available at the Ludlow Conference Centre. Single rooms, twin rooms and dormitories are available. Those wishing to book accommodation in the Ludlow Conference Centre may do so via the registration form which will accompany the 2<sup>nd</sup> circular.

### **Publications:**

In addition to the Field guide/abstracts volume available at the Ludlow meeting, 2011 will see publication of a special issue of the *Bulletin of Geosciences*, up to 200 pages long, devoted to papers with a Silurian theme. Submitted papers should be of international significance. There will be 50 free reprints per paper. All papers will be available online at [www.geology.cz/bulletin](http://www.geology.cz/bulletin). David Loydell and Brad Cramer will be guest editors of this volume.

Further submission details/deadlines, etc. will be distributed soon.

### **Sponsorship:**

We are very grateful to the Palaeontological Association and to Nefitex, who are sponsoring the meeting.

## 7. 2.MEETINGS IN 2010 AND FUTURE

**The Third International Palaeontological Congress, IPC3** takes place in London, June 28 to July 3, 2010. IPC is a major international meeting held once every 4 years under the auspices of the International Palaeontological Association. The meeting provides a showcase for all that is exciting and new in the fields of palaeontology and palaeobiology. IPC3 in 2010 is hosted by the Palaeontological Association and partner organizations, and will be based in Imperial College and the Natural History Museum in the heart of London's 'Albertopolis'. The programme will comprise field trips, plenary lectures, workshops, contributed talks and posters, and thematic symposia. Several of them will threat about the Silurian. For details: <http://www.ipc3.org>,

### **X Argentinean Congress of Paleontology and Biostratigraphy VII Latin American Congress of Paleontology**

20-24 September 2010 - La Plata - Argentina

<http://www.congresospaleo2010.fcnym.unlp.edu.ar>

Dear colleagues:

It is with great pleasure that we invite you to attend the “**2° Symposium on Biostratigraphy and Events of the Lower Paleozoic**”, which will be held within the frame of the “X Argentinean Congress of Paleontology and Biostratigraphy, and VII Latin American Congress of Paleontology” to be carried out in La Plata City, between the 20<sup>th</sup> and 24<sup>th</sup> of September, 2010.

The early Paleozoic was a critical period for the diversification of life on the planet Earth. The Cambrian explosion of life, the great Ordovician biodiversification event, the massive extinction that occurred at the end of the Ordovician, and the appearance of terrestrial plants in the Silurian, represent landmarks in the history of life. Biostratigraphic based studies on a regional or global scale, and their relationships with geological events for this critical interval on the history of the Earth, will result of special interest for the symposium. The contributions (full papers) will be published in English in *Geologica Acta* (<http://www.geologica-acta.com>).

Abstracts deadline: April 30, 2010.

<http://www.congresospaleo2010.fcnym.unlp.edu.ar/es/abstracts.html>

With the hope you could participate with your valuable contributions, best regards,

Conveners: Gladys Ortega and Guillermo Albanesi (CONICET - Universidad Nacional de Córdoba, Córdoba).

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Dear Colleagues,

We are organising a symposium as part of the next **International Palaeontological Congress** ([www.ipc3.org](http://www.ipc3.org)) to be held in London in 2010 (June 28<sup>th</sup> – July 3<sup>rd</sup>) and we hope that you may consider presenting something related to your research on this occasion.

**Symposium Title: Time-Specific Facies: The Colour and Texture of Biotic Events**

Otto Walliser defined "time-specific facies" as times of widespread unusual facies, such as widespread black shales, red shales, stromatolite beds and oolites. The aim of the symposium is really to highlight the concept and potential importance of these unusual sediment types, colours, fabrics that reflect peculiarities of oceanic/climatic conditions, often associated with isotopic and biological events.

The idea for the symposium came about as a result of two recent meetings in 2009: the Silurian Subcommittee of Stratigraphy meeting in Sardinia in June and the NAPC meeting in Cincinnati in June-July where various presentations focused on aspects related to "colour variations" which seem to reflect minor eustatic/climatic changes. Two talks in particular, one by Annalisa Ferretti and Kathleen Histon in Sardinia which introduced and emphasized the importance of microbial activity during the Silurian along the North Gondwana area and one by Carl Brett and Pat McLaughlin at NAPC on colour variation in sedimentation cycles from Laurentia during the Late Ordovician to early Silurian raised a lot of interest in this innovative topic as regards potential for correlation. Both presentations opened up an in-depth discussion of these "signals" from other palaeogeographical areas and the realization that they may be recurrent over long time ranges and across diverse palaeocontinents such as North Gondwana, Avalonia and Laurentia. It is clear that these discussions were among Lower Palaeozoic researchers but we think there is great potential for extending this topic to a wider temporal scale in order to identify pervasive patterns determined by eustatic/ climatic /tectonic changes and the faunal response these may induce.

Hence we thought the IPC3 meeting in London in 2010 could be the perfect forum to explore this potential for high resolution stratigraphy for correlation on a global scale. As with many topics, sometimes examining the data available from another perspective can produce a new solution to a much debated dilemma.

Our intention is to publish a collection of papers resulting from the proposed symposium as a special issue of a peer-reviewed journal with a high impact factor. We hope that a high profile symposium would achieve important results in bringing together researchers with varied data which published as a volume on the topic would then give impetus to further research and future correlation projects.

We really feel strongly about the topic as we realised that so many researchers have data, most unpublished as it was deemed of minor importance, which if interpreted differently may prove significant for correlation. As you can see the topic is broad enough to allow a variety of presentations but the central theme is related to "colour markers" of biotic response to global events.

We sincerely hope you or members of your research group will consider our invitation to be part of this innovative exploratory symposium and look forward to hearing from you soon. More information at <http://www.prg.unimore.it/ipc>.

With best regards

Kathleen Histon, Annalisa Ferretti, Pat McLaughlin and Carlton Brett

# Symposium Title: **Time-Specific Facies: The Colour and Texture of Biotic Events**

**Conveners:** Kathleen Histon<sup>1</sup>, Annalisa Ferretti<sup>1</sup>, Patrick McLaughlin<sup>2</sup> and Carlton Brett<sup>3</sup>

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*Distinct signals, such as rock colour, represent evidence of changing scenarios that appear to reflect a recurrent pattern of biotic response to similar eustatic/climatic/geographic changes perceived to be of global extent. The symposium aims to bring together apparently unrelated diverse lines of investigation in order to define and compare through a long time slice colour markers of global events in an attempt to explore their potential for high resolution stratigraphy and for unravelling complex environment-organism interactions and the coupled sedimentary-fossil record.*

**Keynote speakers:** Anthony Hallam, University of Birmingham, UK

Eberhard Schindler, Forschungsinstitut Senckenberg und Naturmuseum, Germany

**Symposium outline:** Integrated multidisciplinary high resolution studies on biostratigraphically and chronologically well constrained successions over the past decade have focused on determining the relationship between sea-level fluctuations, climate, palaeoceanography, sea-water chemistry, atmospheric composition, etc. and biotic events. Furthermore precise regional sea-level curves and palaeobiogeographic reconstructions and correlations based on sequence and chemostratigraphy have highlighted events comparable on a global scale.

This symposium will seek to take the concept of marine communities beyond the simple idea of depth and palaeogeographic controls on organism distribution and start to look at the temporal complexity. Emerging interbasinal to intercontinental correlation schemes suggest that certain primary attributes of sedimentary successions, such as colour, previously ascribed to palaeogeography and/or palaeotectonics are (in many cases) better explained as the signatures of much more widespread phenomena that may be tied to perturbations of the coupled ocean-atmosphere system. The correlation of pervasive markers often manifested as distinct colour signals such as small scale carbonate and siliciclastic cycles showing variation in colour (i.e. black/red/grey shales or black and red limestones), episodes of stromatolites and microbial activity, ooidal levels, ironstone deposits or specific mineral phases such as chamosite and goethite, etc. has rarely been used to determine global bioevents or been tested as an alternative correlation tool for high resolution stratigraphy. Each of these colour markers represents evidence of changing scenarios that appear to reflect a recurrent pattern of biotic response to similar eustatic/climatic/geographic changes perceived to be of wide extent and may serve in unravelling complex environment-organism interactions and the coupled sedimentary-fossil record.

## **Topics to be explored:**

- 1) What does rock colour and texture reflect in a palaeontological context?
- 2) Does colour and texture vary between isochronous basins and platforms and are those differences reflected in faunal composition?
- 3) Why is it that certain groups or taxa dominate within certain beds, bed bundles, or even formations and are these incursions-outages-and epiboles consistently coincident with colour changes in sedimentology?
- 4) Are certain attributes of sedimentary successions (including colour) signatures of much more widespread phenomena that may be tied to the coupled ocean-atmosphere system?
- 5) What is the expression of shifting ocean chemistry through time and what was its impact on marine organisms?
- 6) How do you deconstruct fossil-bearing sedimentary rocks into separate components representing oceanography (i.e., chemistry, hydrodynamics, primary productivity, etc.) and climate (i.e., aridity, glaciation, etc.)?
- 7) What do colour markers such as carbonate and siliciclastic cycles showing variation in colour (i.e. black/red/grey shales or black and red limestones), episodes of stromatolites and microbial activity, ooidal levels, ironstone deposits or specific mineral phases such as chamosite and goethite reflect?

**Abstract submission opens 1<sup>st</sup> November, 2009 on [www.ipc3.org](http://www.ipc3.org)  
DEADLINE 28<sup>TH</sup> FEBRUARY, 2010**



## 8. SILURIAN RESEARCH in 2009

**Dick Aldridge (U.K.):** The monograph on Silurian conodonts of the Yangtze Platform, South China with Wang Cheng-Yuan has been accepted for publication in *Special Papers in Palaeontology*, and should appear in 2010. I am also involved in a multi-author paper (with Rob Sansom, Kim Freedman, Sarah Gabbott and Mark Purnell) that reassesses the enigmatic Silurian vertebrate *Jamoytius kerwoodi*; this has been submitted for publication.

**Denis Bates (U.K.):** I am actively working on a number of retiolitid graptolites, in conjunction with Anna Kozłowska (Poland), particularly *Paraplectograptus*. A second project with Anna Kozłowska and Alf Lenz (Canada) is the updating of the Retiolitidae section for the *Treatise on Invertebrate Paleontology, Graptolithina*. The revision and updating are nearing completion. Work continues on graptolite ultrastructure.

**John Beck (USA):** I am working on the systematic description of a moderately diverse assemblage of middle Silurian (late Homerian? to early Ludfordian) spore masses from the upper McKenzie and lower Williamsport Formations, Central Appalachians, eastern Laurentia. The spore masses, which range in size from 70 to 1000 microns, contain monotypic clusters of tetrads (cf. *Tetraedraletes*) and dyads (cf. *Artemopyra* and *Dyadospora*) in various states of dissociation. Most spore masses are embedded in smooth extra-exosporeal material; some spore masses are attached to poorly preserved sporangial? cuticle. An undergraduate student at Boston College (Noel Schaff) is studying the petrology and depositional environments of the rocks containing these assemblages.

**Stig M. Bergström (USA):** During the past year, I have been working on several projects dealing with successions round the Ordovician-Silurian boundary in North America as well as in northern Europe. Most have been centered on  $\delta^{13}\text{C}$  chemostratigraphy, biostratigraphy, and regional geological evolution. Two manuscripts summarizing the results of these studies, which are joint efforts with Birger Schmitz, Mark Kleffner, and others, are nearly complete. I am still interested in Llandovery conodonts and conodont biostratigraphy and this year, I plan to restart a long dormant project in central Sweden.

**Olga K. Bogolepova (U.K.):** I am working on projects, related to palaeontology, biostratigraphy and palaeogeography through Cambrian to Devonian, particularly in East Siberia and the Russian high Arctic. Last summer fieldwork targeted sections along the Podkamennaya Tunguska River and in the Irkineeva Uplift of East Siberia.

**Carlton E. Brett (U.S.A.):** In the first half of 2009 a good deal of my time was devoted to the North American Paleontological Convention (NAPC), held here on campus and in the field. (And, yes, I got to play Charles Darwin and disperse copies of his great book for the opening ceremonies!). I was in charge of organizing the 10 associated field trips and was involved in leading pre-, mid- and post-meeting trips on Ordovician, Silurian and Devonian (respectively). A mid-meeting trip on June 24, with Patrick McLaughlin (CM of Silurian Subcommittee) and Mike DeSantis examined the Silurian and Devonian of the Falls of the Ohio area in northern Kentucky and Indiana. Despite sweltering heat, we were able to visit all intended sections, including The Ordovician-Silurian unconformity, Llandovery and Wenlock sections near Louisville, at the Falls of the Ohio, Jeffersonville, Indiana, and Sellersburg Quarry.

In September I presented an invited talk, with Pat McLaughlin on Silurian stratigraphy and tectonics in Ontario and helped in running a field conference for the Canadian Paleontological Conference organized by Frank Brunton (Ontario Geological Survey, Sudbury, Ontario) in Tobermory, and Manitoulin Island, Ontario. During our time at Sudbury, Ontario we were able to thoroughly sample a drill core through the Upper Ordovician and Silurian of the southern Bruce Peninsula, which Tom Algeo (University of Cincinnati), Mike Brookfield (Guelph, Ontario) and I hope to use for developing high-resolution C and Sr isotopic curves through this critical interval of climate change and mass extinction/recovery. Meanwhile, Pat McLaughlin, Brad Cramer (Ohio State University) and I have been sampling outcrops and cores the Silurian of Illinois, Indiana, Ontario, Pennsylvania, and New York to develop C-isotope curves for correlation purposes and for evidence of changes in the carbon cycle during the Silurian and its bioevents. Graduate student Nathan Marshall spent a good deal of the summer at the USGS lab in Denver, Colorado, learning techniques of mass spectrometry and running the C-isotopes on many of our samples. We have just obtained data and have generated several new carbon isotopic profiles that will provide significant insight in to Silurian correlations in eastern North America.

**Robin Cocks** (U.K.) has had a busy year, with (as well as two more face operations) a review paper with Trond Torsvik on the Palaeozoic of Laurentia submitted to *Earth-Science Reviews*, and there is further work in progress on papers with Trond on the Palaeozoic of Africa and Arabia, as well as on Lower Palaeozoic global palaeogeography for the “Green Book” successor edited by Dave Harper. He submitted a short summary paper on Cambrian to Silurian correlation with Richard Fortey and Adrian Rushton, to be published by the *Geological Magazine* early in 2010, but the paper is already on line (see publications). He also submitted a paper, now accepted by *Palaeontology*, on Caradoc (Sandbian and Lower Katian) strophomenid and plectambonitacean brachiopods from Wales and the Welsh Borderland. Work is also in progress with Leonid Popov on Katian and Hirnantian brachiopods from the Chingiz Range of Kazakhstan.

**Paul Copper** Canada: I am still actively working on brachiopod monographic taxonomy of the Late Ordovician and Early Silurian (Llandovery) atrypides, athyrides and spiriferides of Anticosti Island. These are expected to appear in two monographs (some 65 species of atrypides, and ca. 35 species of athyrides), and a shorter paper for the spiriferides (last group with only three Llandovery genera, *Striispirifer*, *Eospirifer* and *Cyrtia*).

Gave two talks at NACP, Cincinnati: Copper, P. Reefs under global climate stress: a Paleozoic paradox from the Late Ordovician through Devonian.

Copper, P. What happened to the spirally lophophorate brachiopods during the multiple Late Ordovician mass extinctions?

**Maria G. Corrigan** (Cagliari, Italy). I’m in the third year of a PhD project at the University of Cagliari (Italy) under the supervision by Prof. Carlo Corradini. My researches deal 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 am studying several sections in various sectors of the chain: Passo Volaia, Monte Zermula, Monte Cocco. In Sardinia researches focus on the Mason Porcus section and on the Pridolian part of the Ockerkalk limestone, particularly the Genna Ciuerciu and the Silius sections. Furthermore, I have cooperated in the organization of the ISSS Field Meeting 2009 in Sardinia.

**Carlo Corradini (Cagliari, 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 *Orthoceras* Limestones in the Italian side of the chain, and several sections are in study, mainly in the Lake Wolayer, Mt. Zermula and Mt. Cocco areas (with L. Simonetto, P. Serventi, M. Pondrelli and M.G. Corrigan). The taxonomic and biostratigraphic study of the conodont fauna from several sections spanning the Silurian/Devonian boundary 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.

The organization of the ISSS Field Meeting in Sardinia in June 2009 gave the opportunity to review and update the knowledge of the Silurian of Sardinia and several outcrops and sections visited during the ISSS 2009 field trip were re-studied and some new localities were investigated. Beside the field trip guide-book, a volume on the Silurian of Sardinia was published (Corradini, Ferretti & Storch, Eds.).

**Bradley D. Cramer (USA)**: I finally graduated with my PhD from The Ohio State University in August 2009, and will be moving on to an NSF postdoctoral fellowship at the Kansas Geological Survey and the University of Kansas, Department of Geology, for the next two years under the supervision of Greg Ludvigson, Luis Gonzalez, and Doug Walker. Several major projects on global chronostratigraphic correlation of the late Llandovery – early Wenlock have recently been finished and are in press and several others (including revised Sr and C curves for the entire Silurian) are nearly finished and should be submitted early in 2010. All of these projects are large collaborations with many co-authors of varying specialties and I would like to thank all of my co-authors and collaborators for their work over the past year or two. I’m sure we are all looking forward to these manuscripts being available in print. The NSF postdoctoral fellowship research for 2010-2011 is to produce a significant number of new single-grain zircon U/Pb age dates to constrain the Silurian timescale more precisely. This timescale work is to be carried out in collaboration with the ISSS and many other folks, but I would love to know if anyone has any other geochronometric projects currently underway in the Silurian. The end goal is an improved Silurian timescale and I would welcome any coordination or collaboration on this effort.

**Aurélien Delabroye (France):** I am finishing my PhD thesis at Lille (France) on acritarch dynamics across the Ordovician-Silurian boundary under the supervision of Marco Vecoli and Thomas Servais (CNRS, University of Lille 1, France). The public defence of the thesis will be scheduled for early 2010. This year, analyses of literature dealing with Late Ordovician (Hirnantian) sections worldwide coupled with personal investigations on acritarchs from this period (Anticosti, Estonia, Argentina) allowed me to clarify some aspects of Late Ordovician global event stratigraphy (e.g., problems of correlations between low latitude carbonate-platforms and peri-Gondwana glacial regions).

Finally, the achievement of taxonomical work on Late Ordovician-early Silurian acritarchs from Estonia (Pirgu, Porkuni, Juuru) and Anticosti (Gamachian, Rhuddanian) allowed me to better apprehend the phytoplankton dynamics across the O/S boundary at low latitudes and to compare these with those observed in North Gondwana. The results are either already published (in press) or currently under final preparation.

**Annalisa Ferretti (Italy):** My Silurian research continues to be concentrated on the biosedimentology and paleoecology of the Austrian Carnic Alps. The work is being carried out together with Kathleen Histon, Hans Peter Schönlaub and Carlton Brett. A comprehensive paper on a sequence stratigraphy study of the Silurian of the Carnic Alps has been recently published in *Palaeogeography, Palaeoclimatology, Palaeoecology*.

I am actually involved (with Kathleen Histon, Patrick McLaughlin and Carlton Brett) in leading the Symposium “**Time-Specific Facies: The Colour and Texture of Biotic Events**” at the next Third International Palaeontological Congress (IPC3) of London 2010. Distinct signals, such as rock colour, represent evidence of changing scenarios that appear to reflect a recurrent pattern of biotic response to similar eustatic/climatic/geographic changes perceived to be of global extent. The symposium aims to bring together apparently unrelated diverse lines of investigation in order to define and compare through a long time slice colour markers of global events in an attempt to explore their potential for high resolution stratigraphy and for unravelling complex environment-organism interactions and the coupled sedimentary-fossil record. Keynote speakers will be **Anthony Hallam** (University of Birmingham, UK) and **Eberhard Schindler** (Forschungsinstitut Senckenberg und Naturmuseum, Germany). The deadline for abstract submission is **28 February 2010**. More information at <http://www.prg.unimore.it/ipc>.

I have recently co-edited (with Alessandra Negri, Phil Meyers, and Thomas Wagner) a Special Issue of *Palaeogeography, Palaeoclimatology, Palaeoecology* concerning "Organic carbon rich sediments through the Phanerozoic: Processes, Progress and Perspectives".

Together with Carlo Corradini, Petr Storch and many other friends from Cagliari and Modena University, we have co-organized the ISSS Field Meeting of Sardinia (June 4-7, 2009). Two related volumes have been published, a global view on “The Silurian of Sardinia”, dedicated to Enrico Serpagli (170 pp.) and the abstract volume. The Proceedings Volume will soon be published in the *Bollettino della Società Paleontologica Italiana*.

**David Holloway (Australia):** I continue with the study of Silurian trilobite faunas from eastern Australia, some of the work in collaboration with Phil Lane (Keele University, UK) who will be visiting Melbourne in the first half of 2010. In addition, much of my time at present is being spent on editing (jointly with John Laurie of Geoscience Australia) a volume of papers on Silurian-Devonian themes, to be published later this year as a Memoir of the Association of Australasian Palaeontologists. A paper with Maria da Gloria Pires de Carvalho (American Museum of Natural History), revising the hitherto poorly known dalmanitid genus *Chacomurus* from the Lower Devonian of Bolivia, has recently been completed.

**Helen Hughes (U.K.):** I am currently writing up my PhD which is based on collections of trilobites from the Silurian reefs of North Greenland. Planned publications include systematic descriptions of many new taxa and the identification of trilobite associations and their taphonomic attributes.

**Lennart Jeppsson (Sweden):** I am working on local Early Sheinwoodian correlations; event effects, developing tools for high-resolution correlations of the Wenlock and Ludlow etc.

**Markes E. Johnson (USA).** I have an ongoing interest in the study of Silurian sea-level fluctuations - both regional and global. This was the topic of my presentation at the 2009 SSS Field Conference in Sardinia, where I compared the Silurian portion of the Paleozoic sea-level curve by Haq and Schutter (2008), as derived from unconformity-bound units, to my data base constructed on fossil community replacement patterns. The paper presented at Villasimius (Sardinia) was accepted for publication in PPP and is now available online. During a portion of my current sabbatical leave (academic year 2009-10), I visited Rong Jia-yu at the Nanjing Institute of Geology and Palaeontology, where we completed a manuscript with taxonomic details of a coral-stromatoporoid fauna from BATER Island (a Silurian continental island) located in Inner Mongolia. With the assistance of Zhan Ren-bin and Huang Bing, we also began a field project near Qujing in Yunnan Province on the disconformity between Middle Cambrian and Upper Silurian strata.

**Erika Kido (Austria)** I am working on the Silurian rugose corals from Japan and China. One of the recent papers deals with the rugose corals from the Kurosegawa Terrane, Southwest Japan, where I discussed their paleobiogeographic implications. I just finished my first postdoc project on the Silurian rugose corals from Japan and China in the Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, under Prof. Wang Xiang Dong. I will continue my studies on Mid-Paleozoic rugose corals from Europe.

**Mark Kleffner (USA).** I am presently actively involved in six projects: (1) a revised conodont-, graptolite-, and chitinozoa-based Silurian chronostratigraphy (with James Barrick); (2)  $\delta^{13}\text{C}$  chemostratigraphy of Ordovician/Silurian boundary strata of the North American Midcontinent (with Stig Bergström); (3) conodont biostratigraphy, oceanic episodes, and  $\delta^{13}\text{C}$  chemostratigraphy of Silurian/Devonian boundary strata in New York; (4) Ireviken Event and Ireviken  $\delta^{13}\text{C}$  excursion (with Brad Cramer and many others); (5) oceanic episodes,  $\delta^{13}\text{C}$  chemostratigraphy, and updated Homerian, Gorstian, and Ludfordian (Silurian) conodont biostratigraphy of southern Laurentia; and (6) Silurian high-resolution stratigraphy on the Cincinnati Arch (with Brad Cramer, Pat McLaughlin, and Carlton Brett).

**Anna Kozłowska (Poland):** I am working on evolution of retiolitid graptolites from Poland, Arctic Canada, Lithuania in collaboration with Denis Bates, Alf Lenz, Mike Melchin, Jorg Maletz, and Sigita Radzevicius. Together with Alf Lenz and Denis Bates we are working on the new edition of Treatise on Invertebrate Paleontology, Graptolithina.

**Jiri Kriz (Czech Republic):** I cooperated on new grant of the Grant Agency of the Czech Republic with L. Slavik, P. Storch and S. Manda (2009-2013): "Integrated stratigraphy of the late Silurian (Ludlow and Pridoli) in the Prague Basin". Early in the spring the lower part of the Pridoli international stratotype Pozary was in detail sampled for conodonts and Bivalvia Communities were studied on the less known Ludlow and Pridoli sections. I was working on the new Treatise volume on Bivalvia (Superorder Nepiomorphia). Together with M. Steinova I studied Uppermost Ordovician (late Hirnantian) bivalves from the Prague Basin.

Other news: I am already retired and I work for the Czech Geological Survey just for 50%. I continued with the transfer of my Lower Paleozoic Bivalvia collection from Bohemia and Europe to the Czech Geological Survey collections. In 2009 transfer of more than 17.000 specimens together with detailed database (3.600 specimens in 2009) was realized.

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

**Alfred Lenz (Canada):** I am working on three main projects. The first is with Anna Kozłowska, Mike Melchin and Sherrill Senior, completing a paper on a fairly large mid-Wenlock, mid?-upper Sheinwoodian, graptolite fauna (35 species), comprising retiolitids, monograptids and cyrtograptids from Arctic Canada. The study combines material from two sources: beautifully preserved, isolated material etched from limestone concretions, and well preserved, but flattened cyrtograptids on shale surfaces. The two modes of preservation demonstrate significant differences in taxon diversities, perhaps in relation to different life-environments. Most of the taxa are recognized elsewhere globally, but two unique and unusual taxa, a cyrtograptid and monograptid, are present. The study brings the number of genera to 29 (compared with eight in the 1970 Treatise of the Graptolithina, Treatise on Invertebrate Paleontology), and summarizes the vastly increased knowledge of the morphology of this very complex group of graptolites.

The third project, also related to the Treatise revision, is the summarization, at an intermediate level, of the general morphology of the Class Graptolithina.

The second project, involving Anna Kozłowska and Denis Bates, and also nearing completion, is an updating of the Silurian retiolitid part of the proposed revision, other than summarizing the text on morphology, is to include many actual photo images, especially SEM images, to accompany the written sections. The project is about half completed and, eventually, I expect to be joined by one or two other graptolite workers.

**Steve LoDuca (U.S.A.):** I continue to work on the taphonomy, systematics, functional morphology, paleobiogeochemistry, and evolution of early Paleozoic macroalgae, especially dasyclads. Work also continues on the stratigraphy of Silurian units within and adjacent to the Michigan Basin. Current collaborators include Michael Melchin (Canada), Heroen Verbruggen (Belgium), Filippo Barattolo (Italy), Denis Tetreault (Canada), and Ernie Behringer (USA).

**David Loydell (U.K.):** Work has commenced (with Petr Štorch and Juan Carlos Gutiérrez-Marco) on Aeronian-Telychian sections around the El Pintado reservoir, Spain. Fieldwork was undertaken in September 2009 and large numbers of samples collected. Other continuing projects are on the Measley Ridge section, Ohio (with Mark, Kleffner, Tony Butcher and others), on the upper Telychian and Sheinwoodian of Wales and on various Graptolite Treatise chapters.

**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. In Estonia, I am busy with three projects: “Upper Ordovician–Lower Silurian conodont biostratigraphy in stratigraphic sequences”, “Ordovician–Silurian boundary in the Baltic area” and “Ordovician and Silurian biodiversity in Baltica: evolution and impact of the changing environment”. Also, joint studies together with colleagues from Estonia, Germany, Russia, Sweden, U.K. and USA on evolution and high-resolution stratigraphy of the Early Palaeozoic sedimentary basins on Baltica and Siberia palaeocontinents are going on.

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

**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. 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. I am collaborating with Charles Mitchell, David Sheets, Petr Storch and Stan Finney, on the study of Late Ordovician – Early Silurian faunas in Nevada and Bohemia, Scotland, and Fan Junxuan and Chen Xu (Nanjing) on the study of Rhuddanian-Aeronian graptolites from South China. We are also working together with Chris Holmden, MSc student Peter Bullock, and others on the stratigraphy and isotope chemostratigraphy of the same successions. I have also been working with Chuck Mitchell, Jörg Maletz and others on phylogenetic analysis of graptolites and related pterobranchs and with Alf Lenz and Ania Kozłowska on some isolated Llandovery and Early Wenlock graptolites.

**Jan Mortier (Belgium).** I continue my work on the Silurian of the Condroz Inlier. I am currently working on the lithostratigraphy and Chitinozoa biostratigraphy on sections of Neuville-sous-Huy, Condroz Inlier, Belgium, ranging from the Telychian up to the lower part of the Ludlow. I will finish the Tihange section (Upper Ordovician to Rhuddanian) this year.

**Axel Munnecke (Germany):** I am currently working on Ordovician and Silurian palaeoclimatology and chemostratigraphy based on stable carbon and oxygen isotopes from brachiopods, whole rocks, and organic material, mostly from Gotland and from China (the latter in collaboration with Zhang Yuandong from the NIGPAS, Nanjing). Furthermore I am interested in the evolution of Palaeozoic calcareous plankton.

**Viiu Nestor (Estonia):** I am still working on Silurian chitinozoans. Some papers are in press. Investigation of Pridolian chitinozoans from 4 East Baltic core sections is in progress.

**Vincent Perrier (France):** I am actually Post-doc in the University of Tartu, Estonia. My research focuses on how Baltic ostracods reacted to rapid environmental changes in the Lower Palaeozoic and I am especially interested in the recovery patterns after the events. I will study crises of different nature: climate / sea level changes (Hirnantian Glaciation), sedimentological changes (Katian / Telychian Bentonites), meteorite impact (Kärdla impact) and water chemistry changes (Ireviken excursion). I also continue my work on the colonization of pelagic environments by Myodocope Ostracodes during the Upper Silurian.

**José Manuel Piçarra (Portugal):** I'm actively working on the Lower Paleozoic stratigraphy of South Portugal (Ossa Morena Zone) and also on the Silurian graptolites from Portugal. I am also studying Silurian graptolite collections of the Armorican Massif (a Portuguese-French project; FCT/Portuguese Science Foundation – CNRS/Brest and Rennes).

**Anne Põldvere (Estonia).** I continue as editor of the journal *Estonian Geological Sections* (issued by the Geological Survey of Estonia). The drill core sections of Estonia range from the Proterozoic (Palaeoproterozoic–Neoproterozoic) to Palaeozoic (Cambrian–Devonian). Nine issues of the journal have been published until now, each dealing with one drill core ([http://www.egk.ee/egk/?r=r2&ra=r2\\_1\\_1&t\\_id=136](http://www.egk.ee/egk/?r=r2&ra=r2_1_1&t_id=136)).

The tenth issue of the journal is under preparation and will appear at the end of 2010. It will focus on the Viki drill core penetrating the Ordovician and lowermost Silurian (Llandovery, Wenlock) sedimentary rocks in the western part of Saaremaa Island, southwestern Estonia (NW part of the East European Platform). The rock composition (carbonates and volcanic ash beds) will be specified, and data on the distribution of chitinozoans, conodonts and scolecodonts and stable isotopes will be provided. A large set of earlier and new data, collected in the 1970s and in 2005–2009, will be analysed mainly by researchers of the Institute of Geology at Tallinn University of Technology and the Geological Survey of Estonia.

**David Ray (U.K.).** My research activities over the past year have focused upon two areas: sequence stratigraphy and bentonite correlation within the Wenlock Series of the Midland Platform, England, and commercial investigations into Silurian eustasy.

As part of my research association with the University of Portsmouth and Neflex Petroleum Consultants I have been working towards establishing a sequence stratigraphic and bentonite framework for the Midland Platform. Collaboration with Carl Brett (University of Cincinnati), Alan Thomas (University of Birmingham) and Adrian Collings (Arup Geotechnics) has demonstrated the use of sequence stratigraphy as a means of correlation within the Homerian of the northern Midland Platform (Ray *et al.*, 2010). Bentonite geochemical fingerprinting work carried out with Adrian Collings and Graham Worton (Dudley Museum & Art Gallery) has confirmed the sequence stratigraphic correlation, and will be submitted for publication early 2010. In addition collaboration with the Tom Richards (Herefordshire & Worcestershire Earth Heritage Trust) has made available bentonite geochemistry data and radiometric dates for the upper Wenlock at Whitmans Hill Quarry, Malverns. Here preliminary studies indicate correlation with the northern Midland Platform on both sequence stratigraphic and bentonite geochemistry grounds. Finally the sea level signature for the entirety of the type Wenlock Series has been established via collaboration with Anthony Butcher (University of Portsmouth) and has been accepted for publication (Bollettino della Società Paleontologica Italiana, Proceedings of the ISSS Field Meeting 2009 in Sardinia).

Within Neflex Petroleum Consultants I have lead a review of the Silurian portion of the Neflex Sequence Stratigraphic Model. Based upon a global re-evaluation of key published sections, 10 sequence stratigraphic cycles and their associated systems tracts and surfaces have been identified. These cycles are biostratigraphically well-constrained, typically identifiable on all major palaeocontinents and have been correlated to key environmental events. Based upon this review it is clear that glacio-eustasy is the principal driving force behind significant Silurian sea level change. At present the petroleum significance of these cycles is being investigated prior to any decision to update the existing Neflex Model.

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

**Desmond Strusz (Australia):** I am just about finished my taxonomic studies of the Wenlock to Pridoli brachiopod faunas of the Yass Syncline in NSW. The small rhynchonellide fauna was published at the beginning of the year, and I have just submitted the final paper, on the spiriferides. A poster summarizing the biostratigraphic results of my studies on the Silurian brachiopods of the Yass-Canberra region will be presented at the forthcoming International Brachiopod Congress in Melbourne, February 2010. If it proves feasible I will prepare a publishable version.

I also investigated a pentameride locality discovered by NSW Geological Survey geologists northeast of Canberra. The specimens proved to be very poorly distorted, but are most likely to be *Kirkidium* (*Pinguaella*).

Two projects await attention. Recent bridgeworks on Woolshed Creek in Canberra, where Silurian fossils were first recognized in Australia, yielded abundant well preserved material, and I intend describing as much as possible of the brachiopod fauna. Dominant is the brachiopod *Atrypa duntroonensis*, whose types from the original surface outcrops are extremely poorly preserved. The second project is to describe a silicified Pridoli fauna from south of Wellington, central NSW. The material, whose age is well controlled by conodonts, was collected and processed by John Farrell of Macquarie University. John has described the Early Devonian fauna from the same area, but is unable to work up the older material, so has passed it on to me.

**Thomas J. Suttner (Austria):** I am working on Siluro-Devonian sections of Austria. A main focus of recent studies is the trans-regional correlation of reefs and reef related deposits. Together with colleagues from the University of Graz, I organized the *Paleozoic Seas Symposium 2009*, which gladly became a very successful meeting. A successor meeting is planned for 2011 (further details will be given in the near future). These days we are working on the proceedings volume related to this symposium.

**Marco Vecoli (France):** My research activities include the palynology and organic geochemistry of Silurian marine sequences from peri-Gondwanan localities, especially the palynostratigraphy and organic geochemistry of the organic-rich black shales of early Silurian age. These studies aim at a better knowledge of mode of origin of organic-rich sediments with source rock potential and the associated petroleum systems, especially in North Africa and the Middle East. Moreover, I am developing the study of miospore palynology for reconstruction of palaeophytogeographical patterns and palaeogeographical reconstruction in the Silurian.

A new project just started concerns the combined chemostratigraphic and palynological study of Silurian sequences in the Gaspé peninsula, Québec, Canada, in collaboration with André Desroschers of the University of Ottawa.

**Jacques Verniers (Belgium).** I'm continuing to work on the chitinozoans around the Silurian-Ordovician boundary in the Rostanga borehole (Scania, Sweden). I'm assisting Jan Mortier with his PhD study on the lithostratigraphy, biostratigraphy with chitinozoans and palaeoenvironmental reconstruction with isotope studies (organic carbon) of the Silurian of the Condroz Inlier (Belgium).

**Olev Vinn (Estonia)** continues work 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.

**9. Publications on the Silurian in 2009 or from earlier not mentioned in previous newsletters.**

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