

# ORDOVICIAN NEWS

SUBCOMMISSION ON ORDOVICIAN STRATIGRAPHY  
INTERNATIONAL COMMISSION ON STRATIGRAPHY

Number 31 (for 2013)

Edited by Ian G. Percival



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## **Cover photo**

The Yerba Loca Formation (Middle-Upper Ordovician flysch) at Jáchal River gorge, in the Western Precordillera, San Juan Province of Argentina (photo by G.L. Albanesi, 2013). This locality was visited during the pre-symposium field trip of the 3rd International Conodont Symposium / 2013 Annual Field Meeting of IGCP 591, and will be viewed again during the post-conference field trip of the 4th International Paleontological Congress in October 2014.

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# ORDOVICIAN NEWS Number 31 (for 2013)

## Chairman's Message

A cursory glance at Google Scholar reveals over **6000** publications involving our system in 2013, indicating another phenomenal year of research on the Ordovician System, its rocks and its fossils. A huge diversity of publications is again reported, ranging from hard-core taxonomy, through many key studies on evolutionary palaeoecology to leading-edge studies on stable isotopes of the system, its magmatism and tectonics. The Great Ordovician Biodiversification Event and the end-Ordovician extinctions continue to be foci for innovative research and high-profile and highly-cited papers. This number is likely to rise in 2014 as the results of the 3rd Annual IGCP 591 meeting in Lund are published later this year (see Early Palaeozoic Global Change, Calner *et al.* in press, online publications, *GFF*). The Lund meeting was an outstanding success and quite unique in formally engaging all three Lower Palaeozoic subcommissions for the first time. The meeting attracted almost 200 participants, including spouses and the organization committee, hailing from 23 countries, and including more than 30 PhD students who presented at the conference! The programme comprised more than 100 oral presentations and about 70 poster presentations, during three days of scientific sessions in Lund and followed by a well-attended post-conference excursion to key Lower Palaeozoic localities in southern Sweden and the Oslo Region of Norway. Both the abstracts (Lindskog and Mehlqvist 2013) and post-conference excursion guide (Calner et al. 2013) are available for download from the IGCP 591 website (links below). Virtually all the manuscripts to be included in the *GFF* thematic publication *Early Palaeozoic Global Change* are already published online on the *GFF* website (see link below) and the hard copy, including more than 70 manuscripts, will be printed in late March. Lead editor Mikael Calner wishes to thank all his guest editors (Guillermo Albanesi, Loren Babcock, Dave Harper, Oliver Lehnert and Mike Melchin) who have helped to assemble this extensive, multidisciplinary volume in only nine months. Useful links:

Abstract proceedings (Lindskog and Mehlqvist 2013, 5.68 MB):

[http://igcp591.org/downloads/lund2013\\_abstracts.pdf](http://igcp591.org/downloads/lund2013_abstracts.pdf)

Field Guide to southern Sweden and Norway (Calner et al. 2013, 35.49 MB):

[http://igcp591.org/downloads/lund2013\\_guidebook.pdf](http://igcp591.org/downloads/lund2013_guidebook.pdf)

Early Palaeozoic Global Change (Calner et al. in press, online publications):

<http://www.tandfonline.com/action/showAxaArticles?journalCode=sgff20#.Uv4wZmwV-70>

Meanwhile, in the Southern Hemisphere in 2013, Guillermo Albanesi and his team from Argentina successfully organised the Annual Field Meeting of IGCP 591, combined with the 3<sup>rd</sup> International Conodont Symposium. The Ordovician System features prominently in the papers presented to this conference (compiled as *Conodonts from the Andes* Publicación Especial N° 13 Asociación Paleontológica Argentina, available for download from <http://www.apaleontologica.org.ar/?p=6829&lang=es>), and also in the associated field trips. If you missed this meeting last year, then you will have a second chance to visit some of the outstanding Ordovician outcrops exposed in the Western Cordillera of Argentina by attending the 4<sup>th</sup> International Palaeontological Congress being held in Mendoza in late September and early October this year and participating in the post-IPC field trip being run by Marcelo Carrera and colleagues.

Two key meetings are rapidly approaching for IGCP 591: Early to Middle Paleozoic Revolution. The **4th Annual Meeting will be hosted in Estonia, between June 10-19, 2014**, with scientific sessions in Tartu to be preceded and followed by two geological excursions to study the Lower Paleozoic carbonate succession of Estonia. The annual theme for 2014 of IGCP 591 targets *Evolutionary paleoecology and paleobiogeography*, however, the annual meeting will not be limited to these topics. A broad range of contributions on Early to Mid Paleozoic geology are expected, from paleontology and stratigraphy to geochemistry, paleogeography and climate modeling. **The IGCP 591 Field Workshop for 2014 will be held from August 12-21 in China.** This meeting will be organised jointly with ISSS, ISOS and ISCS, and will be hosted by the Yunnan University in Kunming (SW China). Its formal theme is *Geologic and biotic events and their relationships during the Early to Middle Paleozoic*, however, the workshop will not be limited to these topics.

We already have an important date for your diary in 2015. The 12th International Symposium on the Ordovician System will be held on the campus of James Madison University ([www.jmu.edu](http://www.jmu.edu)) in the City of Harrisonburg, Virginia, USA (<http://www.harrisonburgtourism.com>). The entire symposium including pre and post conference fieldtrips will run through 3<sup>rd</sup>-17<sup>th</sup> June 2015. For full details please see the First Circular later in this edition of *Ordovician News*.

All these forthcoming meetings will be supported by the Subcommittee and further information is located on the subcommittee's webpages (<http://ordovician.stratigraphy.org>), launched by Olle Hints in late 2012. These are your webpages and I hope many of you will contribute to them, to add a continued dynamism and vibrancy to our system and help promote our exciting Ordovician research to the wider community.

I would like to highlight one last publication! As mentioned elsewhere, the final volume from IGCP 503 was published late in 2013 as Geological Society Memoir 38 (*Early Palaeozoic biogeography and palaeogeography*, edited by Harper and Servais). Twenty-nine chapters cover virtually all the fossil groups through this interval and the volume will be an important source of reference for all Ordovician workers. This has been a very long haul but we are convinced this will be a lasting contribution to Lower Palaeozoic research.

Finally once again I thank all of you, particularly Ian Percival (Secretary) and Andrei Dronov (Vice Chair), for your continued important input and support. It is your system, we merely provide an infrastructure that we hope will stimulate and support your research. And on that note I hope as many of us as possible can meet up in Mendoza between 28<sup>th</sup> September – 3<sup>rd</sup> October this year for our session *Ordovician biotas of Gondwana: responses to global climatic and eustatic events, and their biogeographic relationships within the Ordovician world* (Organizers: David Harper and Andrei Dronov) during the 4<sup>th</sup> International Palaeontological Congress in Argentina.

**David A.T. Harper**

Chair, Subcommittee on Ordovician Stratigraphy

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**International Commission on Stratigraphy  
Subcommission on Ordovician Stratigraphy**

**ANNUAL REPORT 2013**

1. Name of constituent body:

**Subcommission on Ordovician Stratigraphy (SOS)**

Submitted by:

David A.T. Harper  
Chairman, SOS  
Department of Earth Sciences  
Durham University  
Durham DH1 3LE  
UK  
Tel. 0044 1913347143  
Fax 0044 1913345991  
E mail: [david.harper@durham.ac.uk](mailto:david.harper@durham.ac.uk)

Andrei Dronov  
Vice Chairman, SOS  
Geological Institute  
Russian Academy of Sciences  
Pyzhevsky per.7  
119017 Moscow  
Russia  
Tel.: +7 (495) 959-30-17  
Fax: +7 (495) 959-07-60  
E-mail: [Dronov@ginras.ru](mailto:Dronov@ginras.ru)

I.G. Percival  
Secretary, SOS  
Geological Survey of NSW  
NSW Department of Primary Industries  
W.B. Clarke Geoscience Centre  
47-953 Londonderry Road  
Londonderry  
New South Wales 2753  
Australia  
E-mail: [ian.percival@industry.nsw.gov.au](mailto:ian.percival@industry.nsw.gov.au)

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

The Subcommission promotes international cooperation on all aspects of Ordovician geology, specifically stratigraphy. It has a global network involving both academia and industry.

Specific objectives are:

- a. To delimit and subdivide the Ordovician System (and Period) as a part of the overall ICS mission to elaborate the standard global stratigraphic scale. This work aims to establish the boundaries (GSSPs), the correlation of the subdivisions (Stages and Series), the nomenclature of the subdivisions and periodically review the effectiveness and utility of these decisions.
- b. To promote regular international meetings on all aspects of Ordovician geology, especially those devoted to clarifying stratigraphic procedures, nomenclature and methods for use in establishing a unified global time scale and to prepare correlation charts with explanatory notes (the main phase of this latter task is now completed).
- c. To encourage, promote, and support research on all aspects of Ordovician geology worldwide and to provide outlets, *Ordovician News*, international meetings, and a web page, for promoting discussions and reporting results of this research.
- d. To encourage, promote, and support interdisciplinary research on the Ordovician global Earth system, addressing topics that require high-resolution, global correlation.
- d. The ultimate goal of the Subcommission is to provide a high-resolution geological time scale that will be a critical foundation for interdisciplinary research on the global Earth system during the Ordovician Period. The work is broad based and must include specialists in palaeontology, all subdisciplines of stratigraphy (bio-, litho-, chemo-, and magneto-), sedimentology, geochemistry, and tectonics. With a large network including active participants from more than 25 countries, the Subcommission thus involves much of the global geological community.

## 3. Summary table of Ordovician subdivisions

SYSTEM	GLOBAL SERIES	GLOBAL STAGES	KEY GRAPTOLITE/ CONODONT(C) BIOHORIZONS
ORDOVICIAN	UPPER	HIRNANTIAN	← <i>A. ascensus</i> (GSSP-Dob's Linn)
		KATIAN	← <i>N. extraordinarius</i> (GSSP-Wangjiawan North)
		SANDBIAN	← <i>D. caudatus</i> (GSSP-Black Knob Ridge)
	MIDDLE	DARRIWILIAN	← <i>N. gracilis</i> (GSSP-Fågelsång)
		DAPINGIAN	← <i>U. austrodentatus</i> (GSSP-Huangnitang)
	LOWER	FLOIAN	← <i>B. triangularis</i> (C), (GSSP-Huanghuachang)
		TREMADOCIAN	← <i>T. approximatus</i> (GSSP-Diabasbrottet)
			← <i>I. fluctivagus</i> (C) (GSSP-Green Point)

## 4. Organization

- a. Subcommittee Executive (from August 2012)
  - Chairman, David A.T. Harper (UK)
  - Vice Chairman, Andrei Dronov (Russia)
  - Secretary, Ian G. Percival (Australia)
  - 16 other Voting Members
  - Over 100 Corresponding Members

The Subcommittee officers and voting members have been agreed for the next term from 2012-2016. Prior to the Subcommittee's business meeting during the Brisbane IGC (2012) a postal ballot confirmed the election of the new Subcommittee officers, and elected a new group of voting members. The new Subcommittee not only includes a broad national representation and coverage of key fossil groups but also specialists in interdisciplinary fields such as geochemistry and sedimentology.

F.G. Aceñolaza (Argentina)  
G.L. Albanesi (Argentina)  
A.V. Dronov (Russia)  
O. Fatka (Czech Republic)  
D. Goldman (USA)  
M. Ghobadi Pour (Iran)  
D.A.T. Harper (Denmark)  
O. Hints (Estonia)  
Li Jun (China)  
S. Leslie (USA)  
A.T. Nielsen (Denmark)  
I.G. Percival (Australia)  
M.R. Saltzman (USA)  
A. Sa (Portugal)  
T. Servais (France)  
T. Tolmacheva (Russia)  
T. Vandenbroucke (Belgium)  
M. Williams (UK)  
Zhang Yuandong (China).

## 5. Interfaces with other international projects

**IGCP Project 503 (now completed):** Arguably the most sustained rise in marine biodiversity took place during the Ordovician, and the second largest mass extinction event took place close to the end of that Period, coincident with an episode of major climate fluctuation. IGCP project n° 503, a new successor project (IGCP project n° 410) developed a better understanding of the environmental changes that influenced the biodiversity trends in the Ordovician and Early Silurian. In this project, the major objectives were thus to attempt to find the possible physical and/or chemical causes (e.g., related to changes in climate, sea level, volcanism, plate movements, extraterrestrial influences, etc.) for the Ordovician biodiversification, the end-Ordovician extinction, and the subsequent Silurian radiation. The



final volume of the project 'Early Palaeozoic biogeography and palaeogeography' published by the Geological Society (Harper and Servais [eds], Memoir 38) has now been printed (see below).

**IGCP Project 591:** The early to middle Palaeozoic revolution. This new project involving some 400 participants from nearly 40 countries has a strong Ordovician component and is supported by the subcommission. The project has already featured at international congresses in Spain, the UK and the USA. Last June over 200 colleagues gathered in Lund, Sweden for the first ever meeting of all three Lower Palaeozoic subcommissions under the organizational umbrella of IGCP 591. The thematic issue of *GFF* arising from the meeting is in preparation (see below).

## 6. Chief accomplishments and products in 2013 cycle

**a.** *Ordovician News No. 30* was produced and posted on the Subcommission website and is available for download.

**b.** The new website for the Ordovician Subcommission designed and edited by Olle Hints is now very much up and running at <http://ordovician.stratigraphy.org/>.

**c.** Publication of the Geological Society, London Memoir 38, '*Early Palaeozoic biogeography and palaeogeography*'. This Memoir, edited by Harper and Servais, first introduces the content, some of the concepts involved in describing and interpreting palaeobiogeography, and the changing Early Palaeozoic geography is illustrated through a series of time slices. The subsequent 26 chapters, compiled by some 130 authors from over 20 countries, describe and analyse distributional and in many cases diversity data for all the major biotic groups plotted on current palaeogeographic maps. Nearly a quarter of a century after the publication of the 'Green Book' (Geological Society, London, Memoir 12, edited by McKerrow and Scotese), improved chronostratigraphic and taxonomic data together with more accurate, digitized palaeogeographic maps, have confirmed the central role of palaeobiogeography in understanding the evolution of Early Palaeozoic ecosystems and their biotas. All the articles are now available online through the Geological Society's 'Lyell Collection'.

**d.** A substantial *GFF* special issue, arising from the IGCP 591 meeting in Lund, edited by Calner, Lehnert, Albanesi, Babcock, Harper & Melchin: *Early Palaeozoic Global Change*, is near completion and many articles are already available online through the Taylor and Francis website.

## 7. Chief problems encountered in 2013

Critical to the development of the research on the system is the improvement of regional chronostratigraphies, isotope curves, palaeogeographies and zonal schemes. The coming years will see an emphasis on renewed data collection and its integration with the global standard. But this will require global participation of all our regional groups. It is also clear that the system has few reliable, absolute dates. This forms part of a new ISOS sponsored project with StarPlan in the University of Copenhagen.

## 8. Summary of expenditure for 2012-2013

TOTAL INCOME (from ICS): USD 2666

- a. Support for attendance of officers and presenters at the Lund, IGCP 591: 1630 USD.
- b. Grant towards production of Geol. Soc. Memoir on Early Palaeozoic biogeography and geography (colour figures): USD 980.
- c. Miscellaneous costs: USD 56

TOTAL EXPENDITURE USD 2666

## 9. Work plan, critical milestones, anticipated results and communications to be achieved next year

- a. To design and execute a programme of radiogenic dating of key Ordovician horizons (using Pb-Pb isotopes) in collaboration with Dr James Connolly and the state-of-the-art StarPlan laboratory in the University of Copenhagen. Work has already commenced on some key sections in Baltoscandia.
- b. Will stimulate where relevant the production of revised regional correlation charts on the basis of new regional stratigraphic data and their relationship to the newly-established international stages. In additional regional isotope and sea-level data will be added. **During the Prague meeting in May those present agreed to begin discussions in their own regions regarding the possibilities of providing simple correlation charts, linking regional chronostratigraphies to the global stages. Results were discussed in Brisbane, 2012 and Lund, 2013; these will be progressed to publication as a Special Paper, Geological Society.**
- c. Management of Subcommittee will move to Tallinn with a new webmaster, Dr Olle Hints. **This has been achieved.**
- d. The subcommittees will participate in various meetings (and publications arising from these meetings) during 2014, notably in Kunming (August) and Tartu (June).

During the business meeting at the final meeting of IGCP 503 and at the ICS meeting in Prague together with the ISOS meeting in *Alcalá de Henares*, plans were formalized with the agreement of the subcommittee to form a number of working groups in the following areas:

1. There may be a requirement to evaluate the efficacy and utility of our stages and stage boundaries. Where appropriate and/or necessary we will have to move to establish some small advisory groups. **One major boundary problem may need urgent attention and was raised at the congress in Madrid. A position paper is in preparation. This remains the case.**
2. Clearly the Subcommittee can now move with some confidence towards confirming and establishing finer divisions of Ordovician time. In this respect Bergström et al. (2009: *Lethaia*) have divided our international stages into stage slices based mainly on existing biozones. Finer time slices were also proposed by Webby (2004: *The Great Ordovician Biodiversification Event*, Columbia University Press) and used effectively in developing data for the GOBE. As these time divisions are more widely adopted, it would be useful to confirm their definition and status. These time slices have been used in the recent *Palaeogeography, Palaeoclimatology, Palaeoecology* special issue on the palaeoecology of the GOBE edited by Servais and Owen (2010). **This was addressed at the Madrid and Brisbane meetings. There is been no strong commitment to take this forward to date.**

3. Over the last few years we have neglected somewhat the role of the regional groups and the many important regional and diverse stratigraphies that make our system so exciting. A number of the key regional successions were included in the correlation charts provided by Bergström et al. (2009), but there more that require calibration with our new stages. Moreover a few regions such as Baltoscandia and SE Asia were never formally published. This is a priority for our system and work that can involve all our colleagues. **This was fully addressed at the IGC in Brisbane.**
4. Work is now far advanced on a Carbon stable isotope curve for the Ordovician. Consistent results have been already achieved for parts of the column. There are of course other stable isotopes and it will be appropriate and useful to evaluate if we can help develop these curves not least as one of our nonbiologic means of correlation. There are other nonbiologic techniques that we could also consider. **These issues were addressed in a recent issue of *Palaeogeography, Palaeoclimatology, Palaeoecology* edited by Munnecke, Calnar and Harper (2010).**
5. A more difficult area is sea-level or water-depth curves for the period. There have been a number of curves for the Ordovician and many more for particular parts of the period. It would be useful to examine these curves more carefully and the criteria upon which they are based with a move towards developing more standardised curves for the Ordovician. **Some of these issues were addressed in the recent issue of *Palaeogeography, Palaeoclimatology, Palaeoecology* edited by Munnecke, Calnar and Harper (2010) and were addressed further at the Brisbane IGC.**
6. We now have a number of accurate palaeogeographic maps for our period. Not everyone agrees with all the reconstructions and perhaps they never will. But it is possible to engage in cooperation with some of the groups to develop a more standard set of base maps for the period. **This is now an active area research with the wide availability of Trond Torsvik's BugPlates program has formed the basis for many chapters in the recently published *GSL Memoir on Early Palaeozoic biogeography and geography* edited by Harper and Servais (2013).**
7. We already have a number of robust absolute dates for parts of the system but it would useful to develop more, not least to be able to calibrate the true rates of biological and geological process occurring during the period. **Discussions are now ongoing with a number of geochronology laboratories, for example the StarPlan group in Copenhagen, whose terrestrial dating facility is headed up by Dr Jim Connelly. These discussions are ongoing (see workplan for 2014).**
8. We have tended as a group to ignore the economic potential of our system. But, for example in New South Wales, nearly all the gold and copper mines are hosted in Ordovician volcanics of the Macquarie Arc and in China considerable funding is being made available through SINOPEC (the Chinese petroleum company) to support research into Ordovician biostratigraphy. **A strategy is under discussion.**

#### **10. Budget and ICS component requested for 2012-2013**

1. Seedcorn funding for Radiogenic dating programme, mainly fieldwork costs: 2500 USD
2. Support for attendance at IGCP Annual Meeting, Tartu (June 2014): 1000 USD
3. Support for attendance at IGCP Field Meeting, Kunming (August 2014): 2500 USD.

TOTAL 2013-2014 BUDGET: 6000 USD  
 REQUESTED FROM ICS: **6000 USD**

## Potential funding sources outside IUGS

The Subcommittee officers are mainly supported by their research projects for most of their activities.

### 11. Review chief accomplishments over last ten years (2001-2011)

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

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

c. Approval, ratification, and dedication of the Black Knob Ridge section, Oklahoma, USA and the Wangjiawan North, Yichang, China GSSPs for the bases of the Katian and Hirnantian stages, respectively.

d. Approval, ratification, and dedication of the Huanghuachang section, Yichang, China for the base of the Dapingian Stage, which coincides with the base of the Middle Ordovician.

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

f. The 9<sup>th</sup> International Symposium on the Ordovician System held in San Juan, Argentina, in August 2003, in conjunction with the 7<sup>th</sup> International Graptolite Conference and a Field Meeting of the Subcommittee on Silurian Stratigraphy and publication of 556 page proceedings, 130 participants represented 18 countries, 124 papers were presented in technical sessions.

g. Publication of *Ordovician News* nos. 17-27 and their posting on the Subcommittee's web site.

h. Development of the web site "Ordovician Stratigraphy Discussion Group" to facilitate discussions on selection of the GSSPs. This site has evolved into the Subcommittee's web site and also includes postings of *Ordovician News*.

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

j. Sponsorship at the 31st International Geological Congress, Rio de Janeiro, Brazil, 2000, of the symposium "Paleontological, stratigraphical, and paleogeographical relations among South America, Laurentia, Avalonia, and Baltica during the Ordovician."

k. Sponsorship at the 32<sup>nd</sup> International Geological Congress, Florence, Italy, 2004, of the symposium "The global Ordovician Earth system".

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

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

o. Selection of names for 2<sup>nd</sup>, 3<sup>rd</sup>, 5<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup> stages of the Ordovician System.

p. Sponsorship of the 2006 IGCP 503 Glasgow meeting on "Changing palaeogeographical and palaeobiogeographical patterns in the Ordovician and Silurian".

q. Sponsorship of the 2007 Yangtze Conference (the 10<sup>th</sup> Ordovician Conference) that was combined with the 3<sup>rd</sup> Silurian Conference and the IGCP 503 annual meeting in Nanjing. The combined conference was attended by 140 scientists from 24 countries; 66 papers and 22 posters

were presented, with publication of these in a Proceedings volume of 566 pages. Two field guides were also printed.

r. Publication of ‘The new chronostratigraphic classification of the Ordovician System and its relations to major series and stages and to  $\delta^{13}\text{C}$  chemostratigraphy’ *Lethaia* 2008.

s. Support and participation in the following major conferences during 2008: 7<sup>th</sup> Baltic Stratigraphic Conference, Tallinn, and associated field excursions, May 2008 and ‘Development of Early Paleozoic Biodiversity: The role of biotic and abiotic factors, and event correlation’ Moscow, June 2008 and the subsequent field excursion to the Altai Mountains; 33<sup>rd</sup> IGC in Oslo during August 2008 and the IGCP 503 ‘International Congress on Palaeozoic Climates’ in Lille, France during August, 2008.

t. Support, participation and sponsorship of the following major conferences during 2009. NACP Cincinnati 21-26 June and IGCP 503 Copenhagen 31 August – 4 September.

u. Agreement in principle to establish a new range of working groups tackling a wide spectrum of areas of Ordovician with a view to developing new products for the community.

v. Support, participation and sponsorship of Ordovician session at IPC3 in London, June 2010.

w. Publication of a *Special Paper, Geological Society of America* (2010) on Ordovician research (edited by Finney and Berry).

x. Publication of two volumes of *Palaeogeography, Palaeoclimatology, Palaeoecology* (2010) on Ordovician research (edited by Servais and Owen together with Munnecke, Calnar and Harper).

z. Sponsorship of the 2011 Madrid Conference (the 11<sup>th</sup> Ordovician Congress), held in the spectacular surroundings of Alcalá de Henares, with field excursions to Portugal and central and northern Spain. The proceedings ‘Ordovician of the World’ was sponsored by the Subcommittee on Ordovician Stratigraphy. It contains 100 contributions, most of which in the form of short papers, which were delivered as oral presentations or posters at the symposium. This volume represents a wealth of cutting-edge research on Ordovician rocks from around the world, and includes contributions from 228 authors and coauthors from 23 countries on four continents. Three field guides were also printed.

aa. Launch of IGCP 591: The early to middle Palaeozoic revolution. This new project involving some 400 participants from nearly 40 countries will have a strong Ordovician component and is supported by the subcommission.

bb. Support and attendance at a thematic symposium on Ordovician research during IGC 34 in Brisbane: 35.4 International Subcommittee on Ordovician stratigraphy: Ordovician intercontinental correlations: developing global and regional chronostratigraphy. This was well attended and will act as a catalyst for a publication in 2014 on Ordovician chronostratigraphies in the regions.

cc. Publication of the Geological Society, London Memoir 38, ‘Early Palaeozoic biogeography and palaeogeography’. This Memoir, edited by Harper and Servais, first introduces the content, some of the concepts involved in describing and interpreting palaeobiogeography, and the changing Early Palaeozoic geography is illustrated through a series of time slices. The subsequent 26 chapters, compiled by some 130 authors from over 20 countries, describe and analyse distributional and in many cases diversity data for all the major biotic groups plotted on current palaeogeographic maps. Nearly a quarter of a century after the publication of the ‘Green Book’ (Geological Society, London, Memoir 12, edited by McKerrow and Scotese), improved chronostratigraphic and taxonomic data together with more accurate, digitized palaeogeographic maps, have confirmed the central role of palaeobiogeography in understanding the evolution of Early Palaeozoic ecosystems and their biotas. All the articles are now available online through the Geological Society’s ‘Lyell Collection’.

dd. Support and attendance at the 2<sup>nd</sup> Annual Meeting of ICGP 591, supported for the first time by all three Lower Palaeozoic subcommissions. A substantial GFF special issue, edited by Calner, Lehnert, Albanesi, Babcock, Harper & Melchin: Early Palaeozoic Global Change, is near completion and many articles are already available online through the Taylor and Francis website.

ee. A thematic symposium at the 4<sup>th</sup> International Palaeontological Congress, Mendoza, Argentina will be sponsored by the Ordovician Subcommission ‘Ordovician biotas of Gondwana: responses to global climatic and eustatic events, and their biogeographic relationships within the Ordovician world’.

ff. The new website for the Ordovician Subcommission designed and edited by Olle Hints is now very much up and running at <http://ordovician.stratigraphy.org/>.

gg. The chairman recorded the palaeopodcast ‘The Great Ordovician Biodiversification Event’ at <http://www.palaeocast.com/episode-19-the-great-ordovician-biodiversification-event>.

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Attendees at the 2013 Annual Meeting of IGCP 591 at Lund, Sweden  
([http://igcp591.org/media/lund2013\\_group.jpg](http://igcp591.org/media/lund2013_group.jpg))

# IGCP 591: Early to Middle Paleozoic Revolution

## 4th Annual Meeting June 10–19, 2014, Estonia

### Second Circular

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

The 2014 annual theme of IGCP 591 targets **Evolutionary palaeoecology and palaeobiogeography**, however, the annual meeting will not be limited to these topics. A broad range of contributions on Early to Mid Palaeozoic geology are expected, from palaeontology and stratigraphy to geochemistry, palaeogeography and climate modelling.

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

Welcome to Estonia in 2014!

Tõnu Meidla and Olle Hints on behalf of the organizers

<b>Schedule and deadlines</b>	<b>March 31, 2014</b>	Extended (and Final) Deadline for registration, abstracts, and payments
<b>April 1, 2014</b>		Deadline for booking accommodation in selected hotels
<b>May, 2014</b>		Distribution of the Third Circular
<b>June 9, 2014</b>		Arrival to Tallinn (for pre-conference excursion)
<b>June 10-12, 2014</b>		Pre-conference excursion (Ordovician of northern and central Estonia, ending in Tartu)
<b>June 12, 2014</b>		Registration and Ice Breaker in Tartu
<b>June 13-15, 2014</b>		Scientific sessions in Tartu
<b>June 14, 2014</b>		Conference Dinner
<b>June 16-19, 2014</b>		Post-conference excursion (Silurian of central and western Estonia and Saaremaa Island, ending in Tallinn)
<b>July 1, 2014</b>		Deadline for short papers for the special issue in <i>Estonian Journal of Earth Sciences</i>

#### About Estonia

Estonia is located in northern Europe, between Russia, Latvia, Finland and Sweden. With an area of 45,000 km<sup>2</sup> and a population of ca 1.3 million, it is one of the smallest countries in Europe. The capital of Estonia is Tallinn, famous for its medieval old town. Tartu, the second largest city in the country, is best known for its university, established in 1632.

Since 2004, Estonia is a member of the European Union and Schengen visa area. **Should you need a visa to enter the EU, please contact the organizers for official invitation in due time.**

The local currency in Estonia is the Euro (EUR). See <http://www.visitestonia.com> for more information about Estonia.

## Reaching Tallinn

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

## Reaching Tartu

Tartu can be reached from Tallinn by bus or train (180 km); flight connections are limited at present. The easiest option to get to Tartu would be by bus which leaves Tallinn airport every hour (the tickets should be purchased in advance; see <http://www.sebe.ee/en>). The pre-conference excursion will end up in Tartu as well.

## Conference venue

The conference will be held in Tartu, the historical university town of Estonia, located 180 km south of the capital Tallinn. For more information about Tartu and the university see <http://www.tartu.ee> and <http://www.ut.ee>.

The scientific sessions will be in the main lecture hall of the Estonian Biocentre, University of Tartu (<http://vvv.ebc.ee>), located next to the Natural History Museum (see map on conference website). The organizers try to avoid parallel sessions. Poster sessions will be in nearby rooms of the same building. There will be modern presentation equipment, WiFi access etc.

## Accommodation

### In Tallinn

For the pre-conference excursion participants need accommodation in Tallinn for June 9 and 10 (two nights). Rooms are pre-booked in two hotels listed below. For locations see the map on conference website. The excursion coach will stop near both places.

If you plan to stay in any other hotel in Tallinn, please make sure you will be either in front of the Tallink City Hotel or Tallinn University of Technology main building in right time. Should you stay in Tallinn after the conference, or after the post-conference field trip, please book hotels of your choice well in advance.

### Hotel

#### Tallink City Hotel \*\*\*\*

<http://www.tallinkhotels.com>

The Tallink City Hotel is a modern and exclusive business class hotel in the centre of Tallinn.

To book a room with special price please send an e-mail to [hotelbooking@tallink.ee](mailto:hotelbooking@tallink.ee) with your name and accommodation dates, and mention the keyword **IGCP2014**. NB! Pre-booked rooms and special prices are valid only **until April 1st, 2014**.

### Rooms and prices

Standard single: **EUR 54**

Standard twin/double: **EUR 54**

Double de Luxe: **EUR 79**

Junior Suite: **EUR 124**

Suite: **EUR 224**

Royal Suite: **EUR 244**

The rate includes buffet breakfast, internet, morning saunas and VAT. All rooms are equipped with shower or bath, hairdryer, air conditioning, free Wi-Fi, telephone, TV, safe and a mini bar. The hotel has also rooms for guests with special needs.

Double room: **EUR 25**

NB! No breakfast is included.

### Academic Hostel <http://academichostel.com>

Located in the Tallinn University of Technology campus, 7 km from the city centre, this place provides a low-budget accommodation. 10 double rooms are pre-booked. Make personal reservation **before April 1, 2014**, with keyword **IGCP2014**.



## Accommodation in Tartu

Rooms are pre-booked in five hotels of different price range. All are located in city centre, within walking distance from the conference location. Please contact conference secretary for further questions or in case of problems.

### Hotel Antonius \*\*\*\*\*

<http://hotelantonius.ee>

8 rooms pre-booked until **April 30, 2014**.

To make personal reservation send e-mail to [sales@hotelantonius.ee](mailto:sales@hotelantonius.ee) with keyword **IGCP2014**.

### Hotel London \*\*\*\*

<http://www.londonhotel.ee>

12 rooms pre-booked until **April 12, 2014**. For personal booking send an e-mail to [london@londonhotel.ee](mailto:london@londonhotel.ee) with keyword **IGCP2014**.

### Hotel Pallas \*\*\*

<http://www.pallas.ee>

50 rooms pre-booked until **April 12, 2014**. For personal booking send an e-mail to [pallas@pallas.ee](mailto:pallas@pallas.ee) with keyword **IGCP2014**.

### Hotel Dorpat \*\*\*

<http://www.dorpat.ee>

30 rooms pre-booked until **June 1, 2014**. For personal booking send an e-mail to [info@dorpat.ee](mailto:info@dorpat.ee) with keyword **IGCP2014**.

### Hotel Tartu \*\*\*

<http://www.tartuhotell.ee>

30 rooms pre-booked until **May 5, 2014**. Personal booking at hotel website with keyword **IGCP2014**.

### Student accommodation

## Room price per night

Single: **EUR 100**

Twin/Double: **EUR 128**

Breakfast included

Single: **EUR 72**

Twin/Double: **EUR 83**

Breakfast included

Single: **EUR 54**

Twin/Double: **EUR 62**

Breakfast included

Single: **EUR 56**

Breakfast included

Single: **EUR 40**

Twin/Double: **EUR 55**

Breakfast included

Check options and availability at <http://kyla.ee>

## Registration fees and payment Conference fee **EUR 150**

Covers abstract volume, ice breaker, coffee-breaks and conference dinner

### Conference fee for students **EUR 100**

### Accompanying persons fee **EUR 75**

### Late conference fee **EUR 250**

If paid after March 31st, 2014

### Lunch tickets (optional) **EUR 30**

Buffet lunches during the conference, June 13-15, 2014

### Pre-conference excursion **EUR 200**

Ordovician, includes transportation, guidebook, one night accommodation and field lunches. The number of places is limited.

### Post-conference excursion **EUR 400**

Silurian, includes transport, guidebook, accommodation on Saaremaa Island (three nights), and field lunches. The number of places is limited.

Please note that the excursion fees have been reduced compared to the First Circular and optional lunch tickets for the conference days are added.

## Payment by bank transfer

Bank transfer is currently the preferred option for payments. Please use the following:

Beneficiary: **University of Tartu**

Beneficiary bank: **AS SEB Bank**

SWIFT/BIC code: **EEUHEE2X**

International bank account number (IBAN): **EE281010102000234007**

Please indicate the **keyword “IGCP2014” (IMPORTANT!)** and names of the participant(s) in the payment description and ensure that the payment will be without charges to beneficiary.

### **Payment using credit card**

The system for on-line credit card payments is currently being redesigned at the University of Tartu. Before the new system is in place the only option for card payment is to fill a separate form found on conference website and send it to the organizers **by fax: +372 737 5895**. We are sorry for the inconvenience. **NB! Do not send your credit card data by regular unencrypted e-mail.**

### **Cancellation**

Refunds of 50% of the conference and excursion fees will be paid if the cancellation is received before May 1st, 2014. No refunds are possible after this date.

### **Support**

Limited support to young researchers from the IGCP 591 will be possible, please send a free form application alongside with registration form. Note that only participants with presentations will be considered for support.

### **Registration and ice-breaker**

Registration of participants in Tartu will be opened starting at 15:00 on June 12th, 2014, next to the main lecture hall of the Estonian Biocentre, University of Tartu (the main conference room of the IGCP look at <http://vvv.ebc.ee/>; see also the map on conference website). Ice breaker will start at 18:00 on June 12th, 2014.

### **Conference dinner and spouse activities**

The conference dinner will take place on June 14th, 2014. The place will be announced in the Third Circular. Conference Dinner is included in the registration fee.

Spouse activities will be organized in Tartu for the period of scientific sessions. Please indicate your interest in the registration form. Details to be announced.

### **Presentations**

**Oral presentations** are limited to 15 minutes. Slides should be prepared in MS PowerPoint (.ppt, .pptx), Portable Document Format (.pdf) or OpenDocument Presentation (.odp) formats and delivered to the organisers during registration on June 12th.

**Posters** should be prepared in A0 format, preferably in portrait orientation and will be displayed throughout the meeting.

### **Publications**

#### **Abstracts**

The abstract volume will be distributed at the conference. The length of abstracts is limited to one A4 page. Please use 12 pt serif font (such as Times New Roman), single-spacing and 2.5 cm margins; no illustrations. Provide authors' names, affiliations and e-mail addresses after the title. The text should be written in correct English and submitted by e-mail to [igcp591.2014@gmail.com](mailto:igcp591.2014@gmail.com). The Scientific Committee will review the abstracts reserving the

right to accept or refuse any submission. Please note that your paper can be included in the programme only if your conference fee is paid in due time. The deadline is **March 31, 2014**.

### **Thematic issue of *Estonian Journal of Earth Sciences***

A thematic conference volume of short papers will be published in late 2014 as an issue of *Estonian Journal of Earth Sciences*, guest edited by IGCP 591 project leaders. *EJES* is an international geosciences journal indexed in ISI and Scopus. Being an OpenAccess journal, all papers become freely accessible on-line and can be distributed by the authors with no restrictions. See <http://eap.ee/earthsciences> for more information about the journal. All manuscripts for the thematic volume will be subject to regular peer-review and need to follow the journal's style. The length of each paper is limited to four printed pages (text page is about 5000 characters incl. spaces). The deadline for manuscripts is **July 1, 2014**. If you intend to submit a paper to this volume, please indicate that in the registration form.

### **Excursions**

Two excursions are planned to show the Ordovician and Silurian sections in mainland Estonia and Saaremaa Island. The excursions will visit a number of well-known outcrops, in addition to several new quarries that have never been visited by previous geological excursions. **Please note that the number of places is limited on both excursions.** The places are booked in the order of registration date and kept only for those who pay the fee **before March 31**.

#### **Excursion A: Ordovician (June 10-12, 2014)**

The 3-days excursion will start from Tallinn and focus on the Ordovician succession of northern and central Estonia. The excursion will end in Tartu, where the scientific sessions will be held. The cost is **EUR 200** (includes bus travel, field lunches and one night accommodation in NE Estonia); the maximum number of participants is limited to **60**.

Please note that participants will return to Tallinn after the first excursion day (June 10) and need to book accommodation on their own (check the options above). The second day (June 11) will end in NW Estonia where accommodation is arranged and included in the fee. On June 12 the excursion will end in Tartu. The stops to be visited include:

- **Pakri cliff** (Lower Cambrian to Middle Ordovician, condensed siliciclastic to carbonate succession).
- **Vasalemma quarry** (basal Katian; Keila and Oandu regional stages; carbonate mounds and associated facies, corresponding to GICE).
- **Ristna coastal outcrop** (Sandbian; Keila Regional Stage, fossiliferous limestones and a bentonite)
- **Sutlema quarry** (Katian; Nabala and Vormsi regional stages, micritic limestones with various fossils)
- **Väo quarry** (Darriwilian; Lasnamägi and Uhaku regional stages; "building limestone")
- **Drill cores in Arbavere field station** (full Lower Ordovician to basal Silurian succession will be shown)
- **Aluvere quarry** (Sandbian; Haljala Regional Stage, argillaceous limestones with bentonites and various fossils)
- **Saka cliff** (Cambrian to Darriwilian succession)
- **Põhja-Kiviõli open cast mine** (Darriwilian-Sandbian; Kukruse Regional Stage, kerogene-rich limestones alternating with Baltic kukersite oil shale, rich in fossils)
- **Porkuni Quarry** (Hirnantian; Porkuni Regional Stage; tropical shallow-water limestones corresponding to HICE)

### **Excursion B: Silurian (June 16-19, 2014)**

The excursion will show Silurian shallow shelf carbonate succession of central and western Estonia, including the island of Saaremaa, starting from basal Llandovery to topmost Pridoli. The excursion starts in Tartu and ends in Tallinn. The cost is **EUR 400** (includes bus travel, accommodation on Saaremaa for three nights and field lunches); the maximum number of participants is limited to **30**. The stops to be visited include:

- **Kalana quarry** (Llandovery limestones with exceptionally preserved biota)
- **Eivere quarry** (Llandovery)
- **Päri outcrop** (Llandovery)
- **Pulli cliff** (Wenlock)
- **Panga cliff** (Wenlock)
- **Abula cliff** (Wenlock)
- **Suuriku and Undva cliffs** (Wenlock)
- **Soeginina cliff** (Ludlow)
- **Kaarma quarry** (Ludlow)
- **Kaugatuma and Lõo coastal outcrops** (Pridoli)
- **Ohesaare cliff** (Pridoli)

### **Studying geological collections in Estonia**

Large collections of Baltic Palaeozoic fossils and rocks are kept at the Institute of Geology at Tallinn University of Technology and at the Museum of Geology, University of Tartu. Participants of the conference are most welcome to arrive earlier or leave later, in order to study these collections. However, please contact the corresponding curators at your earliest convenience, but no later than **April 1st, 2014**, to ensure availability of the material. Data on nearly half of the collection specimens have been digitised and made accessible on-line at <http://geokogud.info/git> and <http://fossiilid.info>.

**Contact:** Ursula Toom (Tallinn) [ursula.toom@ttu.ee](mailto:ursula.toom@ttu.ee); Mare Isakar (Tartu) [mare.isakar@ut.ee](mailto:mare.isakar@ut.ee).

### **Organizers and Scientific Committee**

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

- Leho Ainsaar (Department of Geology, University of Tartu)
- Heikki Bauert (Institute of Geology at Tallinn University of Technology)
- Olle Hints (Institute of Geology at Tallinn University of Technology)
- Peep Männik (Institute of Geology at Tallinn University of Technology)
- Tõnu Meidla (Department of Geology, University of Tartu)
- Anne Põldvere (Geological Survey of Estonia and Geological Society of Estonia)
- Oive Tinn (Department of Geology, University of Tartu)
- Mikael Calner (Department of Geology, Lund University)
- Brad Cramer (Department of Earth and Environmental Sciences, University of Iowa)
- Dimitri Kaljo (Institute of Geology at Tallinn University of Technology)
- Oliver Lehnert (GeoZentrum Nordbayern, Friedrich-Alexander Universität Erlangen)
- Živilė Žigaitė (Evolutionary Biology Centre, Uppsala University)

### **Contact and further information**

**Website:** <http://igcp591.org/2014>    **E-mail:** [igcp591.2014@gmail.com](mailto:igcp591.2014@gmail.com)

**Oive Tinn** (conference secretary): phone +372 737 6693, [oive.tinn@ut.ee](mailto:oive.tinn@ut.ee)

**Tõnu Meidla** (chairman of organizing committee): phone +372 514 4504

**Olle Hints:** phone +372 51 30 157, [olle.hints@ttu.ee](mailto:olle.hints@ttu.ee), skype: [olle.hints](https://www.skype.com/people/olle.hints)

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IGCP 591: *Early to Middle Paleozoic Revolution*

**Field Workshop 2014**

*jointly with*

**International Subcommittee on Silurian Stratigraphy (ISSS),  
International Subcommittee on Ordovician Stratigraphy (ISOS) &  
International Subcommittee on Cambrian Stratigraphy (ISCS)**

***Second (Final) Circular***

**12–21 August, 2014 Kunming, China**

**Sponsored by:** State Key Laboratory of Palaeobiology and Stratigraphy, Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences Yunnan University

**General Information**

The 2014 Field Workshop of IGCP 591, to be held jointly with ISSS, ISOS and ISCS, will be hosted at the Yunnan University in Kunming (SW China), August 12-21, 2014. Its formal theme is —Geologic and biotic events and their relationships during the Early to Middle Paleozoic□, however, the workshop will not be limited to these topics. The Workshop will include two days of scientific sessions, an one-day trip to the Chengjiang Biota site (mid-conference field excursion), and a 6-day post-conference field excursion to investigate the Lower Paleozoic successions and fossils in northeastern Yunnan Province (western South China paleoplate) and western Yunnan Province (Indo-China and Sibumasu paleoplates). The meeting is being organized jointly by the Nanjing Institute of Geology and Palaeontology (Chinese Academy of Sciences) and the Yunnan Key Laboratory for Palaeobiology (Yunnan University), with financial support from the State Key Laboratory of Palaeobiology and Stratigraphy (LPS), the National Natural Science Foundation of China (NSFC) and IGCP 591.

Welcome to Kunming, China in 2014!

ZHAN Renbin, HOU Xianguang and ZHANG Yuandong on behalf of the Organization Committee

**Key dates**

May 15, 2014

June 25, 2014

June 30, 2014

July 20, 2014

August 12, 2014

August 13, 2014

August 14, 2014

August 15, 2014

August 16-21, 2014

September 20, 2014

December, 2014

**Activities**

Deadline for registration; Deadline for submission of the application for financial supports

Deadline for payments

Deadline for submission of extended summary

Distribution of detailed conference program

Registration and ice breaker at the Yunnan University

Scientific sessions and conference dinner

Mid-conference field excursion to Chengjiang - the original site of the Chengjiang Biota

Scientific Sessions

Field excursion to northeastern and western Yunnan

Deadline for the submission of short papers for *Palaeoworld* as Conference Proceedings

Publication of Conference Proceedings as the fourth issue of *Palaeoworld* in 2014, and possibly the first issue in 2015 (depends on how many manuscripts we receive)

**Kunming and the Conference Venue** Kunming, the capital city of Yunnan Province, is well known as a “Spring City” with temperatures not exceeding than 24°C in August, and may cool to around 10°C in rainy day. There are many scenery spots within and just beside the city proper, such as the Ethnic Village, Mount Xishan (Dragon Gate), Cuihu Lake, the Golden Temple, the Expo Garden, the Black Dragon Pool, the Kunming Safari, etc. Some tourist activities will be arranged for the spouses and companions to visit these sites during the Scientific Sessions of the meeting. The Conference Venue will be on campus of the Yunnan University. This is the largest and the best university in Yunnan Province and one of the top-rank universities in China. It is located beside the Cuihu Lake in the centre of Kunming city proper. It was founded in 1922 and experienced its first flourishing period before 1937. There are more than 10 buildings that are nearly a century old. A small museum of the Chengjiang Biota has hundreds of specimens amongst which many are wonderfully preserved. All attendees will be invited to visit that museum during the Scientific Sessions because the conference will be in the same building.

**Getting to and Leaving Kunming** Kunming Changshui International Airport is one of the five largest international airports within mainland China. It is about 24 km northeast of Kunming city proper, and has many flights to south and southeast Asia, and some European countries and regions. The organizers will provide free pick-up service at the Airport according to the requests from the delegates. The post-conference field excursion will end on August 21, and all delegates will be back to Kunming before dinner time on August 21. Delegates are advised to arrange their own travel accordingly (the accommodation on August 21 is included in the registration fee).

**Accommodations** All delegates are advised to stay in the Reception Centre of the Yunnan University (Yunda Hotel) during the meeting, i.e. from August 12 to August 15 (four nights). It is on the university campus, and very close to the Cuihu Lake. The facilities in the Centre are corresponding to a three-star hotel with internet connection in guest rooms. Fees will be included in the registration fee if delegates choose to stay in the Reception Centre. For delegates who wish to stay off-campus, we provide information on other nearby hotels in the full version of the Second Circular for this meeting, available from the IGCP 591 website <http://igcp591.org/>.

**Registration Fees and Payment** The registration fee for the scientific sessions (see details in the Registration Form) covers: (1) the formal registration, (2) the extended summary volume, (3) the proceedings volume, (4) handouts, (5) accommodations (see Registration Form for options), (6) icebreaker, (7) conference dinner, (8) other meals during the meeting, (9) performance of “Dynamic Yunnan”, (10) coffee breaks, (11) day trip to the Chengjiang Biota site, and (12) the conference backpack. The registration fee for the post-conference field excursion to northeastern and western Yunnan Province covers: (1) the field guidebook, (2) hotels for 6 nights (mostly three stars or higher), (3) meals for 6 days, (4) transportation, (5) the airfare from Tengchong to Kunming, and (6) the tickets to geoparks, historical sites and museums. It is possible for students and young researchers to apply for a limited amount of financial support.

**IGCP 591 Kunming Meeting Account Information:** **NAME:** Huang Bing **ACCOUNT:** 6217866100001557227 **SWIFT CODE:** BKCHCNBJ940 **BANK NAME:** Bank of China Nanjing Chengzhong Sub-Branch **ADDRESS:** No. 29 Hongwu Lu, Nanjing, Jiangsu, CHINA

**Applying for Financial Support** With the supports from the State Key Laboratory of Palaeobiology and Stratigraphy (LPS), the National Natural Science Foundation of China

(NSFC) and the IGCP 591, the organizers will be able to provide some financial supports for those who have financial difficulties but are wishing to attend this meeting. Each award will be a reasonable amount up to \$500 US to cover all relevant expenses during the indoor meeting, the mid-conference field excursion and part of the post-conference field excursion fees. The applicant must give an oral presentation during the Scientific Sessions to qualify for the award.

All young attendees (particularly PhD students and postdoctoral fellows) are welcome to submit their applications for this special award by providing the following: 1) A formal registration form. 2) A detailed personal CV including Education, Research and working experiences (if applicable), List of publications, etc. 3) A personal statement (i.e. Application) (one page). All applications will be assessed by a committee composed of the chairmen of the Organization Committee, ISSS, ISOS and ISCS, and Dr. Brad Cramer (senior leader of IGCP 591). The award winners will receive an email confirmation from the organizer before June 25, 2014.

**Registration and Ice-breaker** The registration desk will be open at 8:30 AM on August 12, 2014, and will remain open for the day. The registration will be in the lobby of the Reception Centre of the Yunnan University (Yunda Hotel). The Ice-breaker will start at 18:00 in the dining hall just opposite of the hotel building. It will be a Chinese buffet with some wine and ample supply of beer.

**Conference Dinner** The conference dinner will be a typical Chinese dinner with 12 people per table and enjoying various dishes together with some wine and Chinese liquor. It will take place at Weicai Restaurant at 18:00 on August 13, 2014. All delegates will be invited to watch a 90-minute performance of *Dynamic Yunnan* after the dinner (the performance is within walking distance from the dinner place). The performance was created and directed by the very famous Chinese dancer Yang Liping, and includes various singing and dancing of several ethnic groups in Yunnan Province.

**Presentations** Each oral presentation will be limited to 20 minutes (15 min talk + 5 min discussions). Slides should be prepared in MS PowerPoint (.ppt, .pptx), or Portable document format (.pdf), and delivered to the Organizers during the registration on August 12. Posters should be prepared in a size of 90 cm x 120 cm (width and height, respectively), and will be displayed throughout the Scientific Sessions.

**Publications** 1. Extended summary (up to 4 printed pages, including references, and figures) will be formally published by the Nanjing University Press (Eds. HUANG Bing and ZHAN Renbin). **Deadline for submission: 30 June, 2014.** 2. A proceedings volume of full papers (within 10 printed pages) will be published in *Palaeoworld*, a peer-reviewed and SCI-cited international journal (Eds. ZHAN Renbin, JIN Jisuo and David HARPER). **Deadline for submission: 20 September, 2014.** 3. A field guide will be published by Science Press (Beijing) (ZHANG Yuandong et al.). All three publications will be distributed to all delegates. The Summary Volume and the Field Guide will be available at the meeting.

### **Meeting Itinerary and Field Excursions**

**Tuesday, 12 August 2014.** Registration throughout the day. Icebreaker at the dining hall opposite the Hotel building, 18:00–21:00. You can also upload presentations and mount posters during the icebreaker.

**13 August.** Opening ceremony and Scientific sessions. Presentations beginning at 9:00 and ending at 17:30; posters display throughout the meeting.

**13 August (evening).** Conference banquet at Weicai Restaurant, 18:00-19:30; Watch the performance —Dynamic Yunnan, 20:00-21:30.

**14 August.** Day trip to the Chengjiang Biota sites. All delegates will visit the original site of the Chengjiang Biota—the Maotianshan Mountain, and the Fuxian Lake just beside it (the deepest fresh water lake on plateau). Lunch will be by the Fuxian Lake.

**15 August.** Scientific sessions.

**16~21 August.** Post-conference excursion to northeastern and western Yunnan Province studying the Lower Paleozoic sequences and fossils of South China, Indo-China and Sibumasu paleoplates (back to Kunming in the evening of 21 August).

**22 August.** Delegates depart, or continue their own tourist activities. Maps and other tourist information about the Kunming Changshui International Airport, shopping, sightseeing, and transportation in Kunming, will be available during the meeting.

### **Mid-conference Field Excursion**

Leaders: Hou Xianguang, Feng Zhuo, Cong Peiyun and Ma Xiaoya

Transportation: By coach through the entire trip.

8:00am: Departure from the Conference Venue, Kunming. 10:00~10:40: Maotianshan Mountain, the original fossil site of the Chengjiang Lagerstätte, National Geopark, and UNESCO Heritage.

11:20~14:30: Lunch, tour to the Fuxian Lake and the local museum in Chengjiang County town.

15:30~16:30: Haikou fossil site, a classical fossil site of the Chengjiang Lagerstätte and about 75 km away from the Maotianshan. All delegates will have opportunity to make their own collection of the Chengjiang biota here. Most of the best preserved fossils of the Chengjiang biota were collected at this site, particularly those exceptionally well-preserved bradoriids, worms, algae, arthropods, and possibly those primitive fishes. 16:30~18:00: Back to the Conference Venue, Kunming.

**Post-conference Field Excursion** Participants limit: Up to 40.

Leaders: Zhang Yuandong, Wang Yi, Zhan Renbin, Fan Junxuan, Liu Jianbo and Zhou Zhiqiang  
Transportation: By coach through the entire trip, but will take a flight from Tengchong to Kunming in the evening of August 21.

**Day 1** (Aug. 16): Kunming to Qūjing, northeastern Yunnan in the morning, and investigating the upper Silurian sequence and fossils of South China paleoplate in the afternoon (three academic stops at Chongjiawan, Longwangmiao and Hongmiao, respectively). Overnight in Qūjing City.

**Day 2** (Aug. 17): Qūjing to Dali, western Yunnan (about 450 km, freeway). On the way, all delegates will be invited to visit the extensive Mesozoic red deposits of terrestrial facies, and the famous ‘Dinosaur Valley’ where over a hundred skeletons of the Middle Jurassic *Lufengosaurus* in association with some other prosauropoda dinosaurs were buried and are being exhibited *in situ*. Overnight in the Dali Ancient City.

**Day 3** (Aug. 18): Morning: Investigate the Ordovician sequence at Haidong section (paleogeographically the northern extension of the Indo-China paleoplate), and collect fossils of late Dapingian to Darriwilian age within the Xiangyang Formation at three academic stops, including brachiopods, trilobites, bivalves, graptolites, bryozoans, etc. Afternoon: Visit: (1) the Cangshan World Geopark, where evidence of the Quaternary Dali Glaciation was recorded, (2) the Dali Ancient City (1200 years old), and possibly (3) the famous Chongsheng Temple (time permitting). Overnight in the Dali Ancient City.

**Day 4** (Aug. 19): Morning: Dali to Baoshan (about 3-hour drive on freeway). Afternoon: Investigate the Ordovician sequence at the Laojianshan section (west of but in the vicinity of the Baoshan City proper) (paleogeographically part of the Sibumasu paleoplate), and collect Darriwilian to Katian fossils in the Shihtien and Pupiao formations, including abundant



brachiopods and trilobites together with some graptolites, bivalves, echinoderms, etc. Overnight in Baoshan.

**Day 5** (Aug. 20): Morning: Investigate the Silurian sequence at the Laojianshan section, including several stops on the Ordovician-Silurian boundary, Aeronian, Telychian, Ludfordian and Pridoli outcrops, respectively. Afternoon: Baoshan to Tengchong (about 2.5-hour drive on freeway). Overnight in Tengchong County Town.

**Day 6** (Aug. 21): Touring in Tengchong, and coming to Kunming (by air) Morning: Visit —Tengchong Hot-spring Park (tens of hot springs). Afternoon: Visit —Tengchong National Volcanic Geopark (check at least two volcanic craters). Evening: Tengchong to Kunming (about 50 minutes by air) Overnight in Kunming.

**Day 7** (Aug 22): Delegates depart for their own destinations.

### **Organizers and Scientific Committee**

ZHAN Renbin (chair), Nanjing Institute of Geology & Palaeontology

HOU Xianguang (vice-chair), Yunnan University, Kunming

ZHANG Yuandong (vice-chair), Nanjing Institute of Geology & Palaeontology

FENG Zhuo (secretary), Yunnan University, Kunming

HUANG Bing (secretary), Nanjing Institute of Geology & Palaeontology

Mike MELCHIN (ISSS), St. Francis Xavier University, Canada

David HARPER (ISOS), Department of Earth Sciences, Durham University, UK

ZHANG Xingliang (ISCS), Northwest University, Xi'an

WANG Yi, Nanjing Institute of Geology & Palaeontology

CONG Peiyun, Yunnan University, Kunming China

WU Rongchang, Nanjing Institute of Geology & Palaeontology

YANG Qun, Nanjing Institute of Geology & Palaeontology

LIU Yu, National Natural Science Foundation of China

Brad CRAMER, University of Iowa, USA

Jisuo JIN, Western University, Canada

**Contact** Please contact us any time when you have questions about this meeting.

HUANG Bing: bhuang@nigpas.ac.cn, mobile: +86-13913927224, Office: +86-25-83282189.

ZHAN Renbin: rbzhan@nigpas.ac.cn, mobile: +86-13851647619, Office: +86-25-83282132.

### **Registration Form**

A Registration Form is available in the full version of the Second Circular for this meeting, available from the IGCP 591 website <http://igcp591.org/>

Please fill in the form, scan it and send it to Huang Bing (bhuang@nigpas.ac.cn) or Zhan Renbin (rbzhan@nigpas.ac.cn) at your earliest convenience before May 15, 2014.

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**4th International Palaeontological Congress**  
*The History of Life: a View from the Southern Hemisphere*  
**Mendoza, Argentina September 28 – October 3, 2014**

Full details of the 4<sup>th</sup> IPC are available from the Congress website  
<http://www.ipc4mendoza2014.org.ar/>

**Please note the following important dates**

Close of Early Bird Registration has been extended to **March 31, 2014**

Final day for booking of field trips **March 31, 2014**

Deadline for submission of Abstracts **April 15, 2014**

Post-congress field excursion **A Palaeozoic Marine Journey through the Argentine Precordillera** (October 4-7) will visit significant Ordovician outcrops (see photographs below)

**Leaders:** Marcelo G. Carrera (CICTERRA-CONICET, Universidad Nacional de Córdoba), Gabriela Cisterna (CONICET, Universidad Nacional de La Rioja), Juan J. Rustán & Andrea Sterren (CICTERRA-CONICET, Universidad Nacional de Córdoba)

The main purpose of the field trip is to provide an introduction to the Geology and Palaeontology of the Argentine Precordillera in San Juan Province. Understanding the geological framework and palaeontology of this basin is essential to many current and proposed ideas related to the origin and evolution of this region and its fossil biota.

The Precordillera basin in Western Argentina includes one of the most spectacular Palaeozoic outcrops worldwide. It comprises 3500 meters of Cambrian-Lower Ordovician carbonate units with plentiful fossil remains mainly represented by brachiopods, trilobites, sponges, echinoderms and molluscs. The route as chosen will show also the different Upper Ordovician, Silurian and Devonian outcrops composed of thousands of meters of siliciclastic units dominated by brachiopods, trilobites, echinoderms and corals. Finally, superb continental and marine Carboniferous and Permian richly fossiliferous outcrops cap the Palaeozoic succession with amazing landscapes.



**Left:** Guandacol Formation (Carboniferous continental strata) unconformably overlying the San Juan Formation (Lower-Middle Ordovician marine limestones – close to the road) at Buenaventura Luna locality, Precordillera of San Juan Province, Argentina (photo by Guillermo Albanesi, 2013). **Right:** Tremadocian reef-mounds from the Cerro La Silla section (base of the San Juan Formation) in the Argentine Precordillera (photo by M. Carrera).

**12th ISOS First Circular**  
**June 2015 at James Madison University, Harrisonburg**  
**Central Appalachian Mountains**  
**Eastern United States**

NOTE: All costs listed are *estimates*.

**Organizing Committee**

Stephen A. Leslie, James Madison University (Chair)  
Daniel Goldman, University of Dayton (Co-Chair)  
John T. Haynes, James Madison University  
Matthew R. Saltzman, The Ohio State University  
John Taylor, Indiana University Pennsylvania  
Achim Herrmann, Louisiana State University  
Charles E. Mitchell, University of Buffalo  
John E. Repetski, United States Geological Survey  
Randy Ordnorff, United States Geological Survey  
Stig M. Bergström, The Ohio State University  
Jesse Carlucci, Midwestern State University  
Stephen R. Westrop, University of Oklahoma

**Important Dates**

**First Circular distributed** March, 2014  
**Second Circular scheduled** September/October 2014 [including Call for Abstracts]  
**Third Circular scheduled** March 2015 [with provisional program]  
**Pre-Meeting Field Trips** June 3-7, 2015  
**Technical Sessions** June 8, 9, 10, 2015  
**Conference Field Trip** June 11 (included in registration)  
**Post-Meeting Field Trips** June 12-17, 2015.

**Location**

The meeting will be on the campus of James Madison University ([www.jmu.edu](http://www.jmu.edu)) in the City of Harrisonburg (<http://www.harrisonburgtourism.com>). We are located in the beautiful Shenandoah Valley of Virginia (<http://www.shenandoahvalleysbest.com/>) close to major highways (Interstate 81 and Interstate 64) and serviced by Shenandoah Regional Airport (airport code SHD, <http://www.flyshd.com/>). Both Richmond, Virginia (airport code RIC) and Washington, D.C. (airport code WAS) are approximately two hours away by car. Charlottesville (airport code CHO) is one hour away. Coaches will be available for transportation from Dulles International Airport (Airport Code IAD) to Harrisonburg at two times on June 7<sup>th</sup>. We will also provide coaches, if necessary, to Dulles on the morning of June 12<sup>th</sup>.

The town of Harrisonburg was officially chartered in the late 18th century, though its settlement began much earlier. Its population is just under 50,000 and growing. The weather in June is moderate, with average monthly temperatures ranging from an average low of about 15 °C (59°F) at night to an average high of 28°C (83°F) during the day.

Those who enjoy outdoor activities will find many opportunities nearby for getting out. JMU's location lies between the Blue Ridge Mountains to the east and the Valley and Ridge to the west. Shenandoah National Park is 15 miles to the east and offers some of the best scenery in the eastern US along the scenic Skyline Drive.

### Technical Sessions

Technical sessions will be held at the university, and there will be ample spaces for small gatherings of all sizes. The Department of Geology and Environmental Science at JMU (<http://www.jmu.edu/geology/index.shtml>) is one of the largest undergraduate-focused programs in the eastern US, with over 15 faculty and roughly 130 geology and Earth science majors. The resources of the department, e.g. lab spaces equipped with microscopes, will be available during the meeting. If there is a specific type of space that your research group needs for a meeting, please let us know and we will do all we can to arrange it for you.

### Publication

A conference volume will be published as part of a theme issue for the journal *Stratigraphy*. A Short Papers/Abstracts volume and a Field Guidebook volume will be available at the meeting as a pdf and given out to participants in printed form. The *Stratigraphy* theme issue will be published post meeting. Invitation for papers/call for papers for the Theme Issue of *Stratigraphy* is forthcoming. The Short Papers/Abstracts volume and Field Guidebook volume pdf will be available at the public access site for *Stratigraphy*, on the Ordovician Subcommittee website, and on the meeting website with free access.

### Lodging & Meals

Both lodging and meals are available on-campus. Below are current costs. Please note that these costs may increase at a maximum rate of 5% per year.

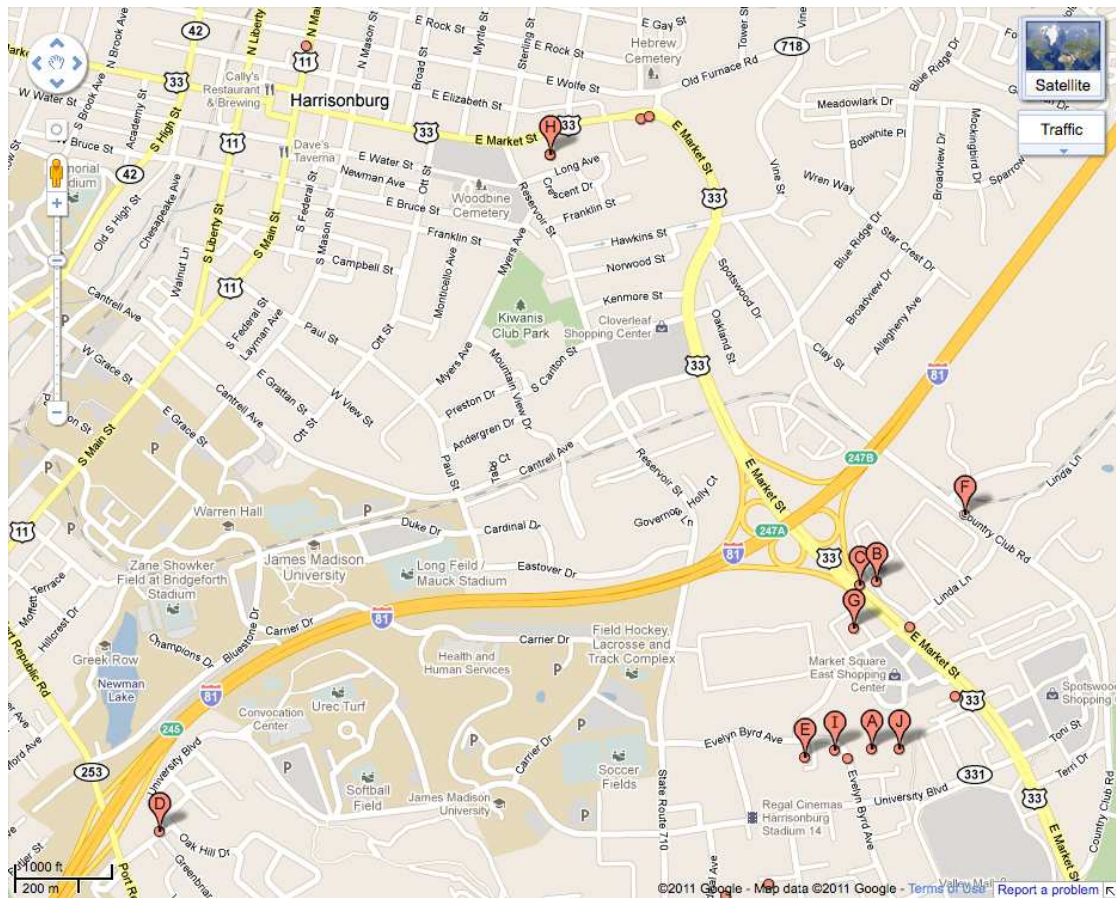
<b><u>University dorm housing*</u></b> <b>(Per person/per night)</b>	<b>NO A/C</b>	<b>WITH A/C</b>
SINGLE OCCUPANCY	\$27.50	\$36.50
DOUBLE OCCUPANCY	\$18.70	\$26.00

### **University meal plan** **(Per person/per day)**

	<b>MON - SUN</b>
Breakfast	\$6.50
Lunch	\$8.25
Dinner	<u>\$8.50</u>
	\$23.25 + 6.5% local meals tax

\* Room rates do not include linen. For optional linen service, a per person charge of \$7.50 per week will be assessed.

In addition to the university housing and meal plan there are many hotels and restaurants within easy walking distance. The hotels listed below and shown on the map are examples of what is in close proximity to the university and to the proposed meeting venue. Prices subject to change.



**Hotel/Inn Conference Rates are subject to change based on hotel contract.**

**A** Courtyard by Marriott  
 1890 Evelyn Byrd Ave.  
 ph 540.432.3031  
 fx 540.432.3032  
 reservations # same  
**Conf Rate:** \$79 + 11% tax  
 Contact: Franita Coleman  
 email: franita.coleman@marriott.com

**B** Comfort Inn  
 1440 E. Market St.  
 ph 540.433.6066  
 fx 540.433.0793  
 reservations # same  
**Conf Rate:** \$69 - \$89 + 11% tax  
 Contact: Jenifer Jackson

**C** Holiday Inn  
 1400 E. Market St.  
 ph 540.433.2521  
 fx 540.434.7693

*(Holiday Inn continued)*  
 reservations # 800.708.7037  
**Conf Rate:** \$83 + 11% tax  
 Contact: Brenda Zirkle

**D** Days Inn  
 1131 Forest Hill Rd.  
 ph 540.433.9353  
 fx 540.433.5809  
 reservations # 800.457.2792  
**Conf Rate:** \$55 + 11% tax  
 Contact: Andy

**E** Quality Inn  
 1881 Evelyn Byrd Ave.  
 ph 540.442.1515  
 fx 540.442.6655  
 reservations # 800.526.3766  
**Conf Rate:** \$77 + 11% tax  
 Contact: Christine Forehand  
 harrisonburgva@cphosp.com

**F** Candlewood Suites Extended Stay  
~\$65/night  
1560 Country Club Road, Harrisonburg  
(540) 437-1400

**G** Best Western  
45 Burgess Rd.  
ph 540.433.6089  
fx 540.433.6485  
**Conf Rate:** \$64 + 11% tax  
Contact: Gina Boyers/Janice Hartman

**H** Stonewall Jackson Inn B & B  
~\$149/night  
547 East Market Street, Harrisonburg  
(800) 445-5330

**I** Sleep Inn & Suites  
1891 Evelyn Byrd Ave.  
ph 540.433.7100  
fx 540.437.2144  
res # same  
**Conf Rate:** \$72 + 11% tax  
Contact: Julie Spritzer  
julie@beckcompanyhotels.com  
[dennis@beckcompanyhotels.com](mailto:dennis@beckcompanyhotels.com)

**J** Hampton Inn Harrisonburg  
85 University Blvd.  
ph 540.432.1111, 437-1402  
fx 540.432.0748  
reservations # same  
**Conf Rate:** \$84 + 11% tax  
Contact: karennesselrodt@hilton.com

*(following not shown on map)*

Fairfield Inn & Suites  
1946 Medical Ave., 22801  
ph 540.433.9333  
fx 540.433.9332  
reservations # 800.228.2800  
**Conf Rate:** \$83 + 11% tax  
Contact: Richard Smith  
email: [rsmith@pgmhotels.com](mailto:rsmith@pgmhotels.com)

Residence Inn  
1945 Deyerle Ave., 22801  
ph 540.437.7426  
fx 540.437.7425  
reservations # same  
**Conf Rate:** \$83 - \$99 + 11% tax  
Contact: Jordan Cassell  
jordan.cassell@marriott.com

**Field Trips: Details of the field trips will obviously change as they are more fully planned. There will be at least one pre-meeting field trip, a conference fieldtrip to Ordovician localities in the Shenandoah Valley area, and a post-meeting field trip.**

**To gauge the level of interest in the potential field trips, we request that those who are either (a) definitely planning, or who are (b) highly likely, to go on one or more field trips, please e-mail Steve Leslie [lesliesa@jmu.edu](mailto:lesliesa@jmu.edu) with your intentions by June 30, 2014. This does not obligate you (or us) but will greatly assist our planning.**

### **Pre-meeting field trips:**

#### **Southern Appalachians – Leaders: Achim Herrmann and John Haynes**

This trip will begin in Birmingham, Alabama on June 3<sup>rd</sup> and will spend four days, June 4<sup>th</sup>-7<sup>th</sup>, visiting field sites. We will travel northeast in the Valley and Ridge province through northeastern Alabama, northwestern Georgia, eastern Tennessee, and western Virginia. We will examine exposures in both eastern and western facies of Ordovician strata. At eastern exposures we will see the carbonate to clastic transition, including the transition from shelf and shelf margin carbonates of the Lenoir and Pratts Ferry Formations upsection to the basinal graptolitic mudrocks of the Athens Shale, and the parallel transition of the Lenoir upsection into the redbeds and quartz arenites (Bays Formation, Greensport Formation, Colvin Mountain Sandstone) that are the molasse of the Blount foredeep section of the Taconic foreland basin. Near Gadsden we will see a spectacular exposure of the Attalla Chert Conglomerate above the regionally extensive Knox Unconformity. In western exposures we will see shallow shelf carbonates of the Chickamauga Group including a section where the first carbon isotope investigations of Ordovician strata in Alabama are being carried out. K-bentonites including the Deicke and Millbrig will be seen at several of these exposures as well, in both eastern and western facies belts. Traveling toward Chattanooga, Knoxville, Roanoke, and Harrisonburg we will again stop at many exposures of the Ordovician carbonates and clastics that comprise the Taconic shelf to basin and basin fill sequence of the southern Appalachians. There will be opportunities to examine shelf edge and downslope buildups in the Holston, Rockdell, and Effna Limestones, as well as additional exposures of the Knox Unconformity that will show the diversity of strata which were deposited on the karstic surface of the Knox. Sandbian and Katian K-bentonites and associated coarse sandstones including the Upper Ordovician clastics of the Sequatchie, Oswego, and Juniata Formations will provide a look at the transition from carbonate to clastic sedimentation that occurred regionally during the later Ordovician as a result of uplift in the Taconic orogen. Regional sealevel changes will be discussed as well. Exposures of the unconformable Ordovician-Silurian boundary will also be seen. A side trip to Nashville to see the Middle and Late Ordovician platform carbonates there is possible as well. Discussions at most stops will include summary findings from conodont and graptolite biostratigraphic investigations, as well as the local and regional paleoecological, tectonic, and structural settings and interpretations. This trip will end at the conference site in Harrisonburg, Virginia. Lodging, food and transportation in the field are covered in the field trip registration. Registration is expected to be approximately \$600 for a minimum of 8 and a maximum of 20 participants.

***Possible trip to Oklahoma depending on interest***

***Leaders: Dan Goldman and Jesse Carlucci***

*This trip will visit the extensive Ordovician exposures in Oklahoma including the exposures of the upper Arbuckle Group (Early Ordovician), Simpson Group (Middle-Late Ordovician) and the Viola Springs Fm., Sylvan Shale, and Keel Limestone (Late Ordovician) along Interstate 35 through the Arbuckle Mountains. We will also visit the Womble Shale and Big Fork Chert at Black Knob Ridge, site of the Katian GSSP, and the Fittstown section that exposes the Bromide Formation and Viola Springs Fm., which is the auxiliary Katian GSSP section. This field excursion will meet on June 3<sup>rd</sup> at the airport in Dallas, TX. We will spend June 4<sup>th</sup> - 6<sup>th</sup> and visiting field sites, and return to Dallas by 8:00 AM on June 7<sup>th</sup> where participants will fly to Harrisonburg. Participants need to make their own flight arrangements. Lodging, food and transportation in the field are covered in the field trip registration. Registration is expected to be approximately \$550 for a minimum of 8 and a maximum of 20 participants.*

**Conference Field Trip – Leaders: John Haynes and Randy Orndorff**

The Shenandoah Valley hosts classic Ordovician exposures of the Early, Middle and Late Ordovician. We will take advantage of these exposures during a trip on the third day of the four day conference to the classic Tumbling Run section at Strasburg, Virginia, where the carbonate shelf to ramp to basin transition that resulted from the Taconic orogeny in this region is exposed and which transitions upsection to the flysch of the Martinsburg Shale and then to the Silurian clastics. This will be followed in the afternoon by a trip to Germany Valley, West Virginia, where the shelf sequence is quite different from what is seen at Tumbling Run because of differences in depositional settings and perhaps sealevel change as well as accommodation space in the Taconic foredeep.

**Post-meeting field trips**

**Central and north-central Appalachians**

**Leaders: Chuck Mitchell, John Taylor, John Repetski**

This trip will leave from Harrisonburg on June 12 and begin with the exposures of nearly the entire Ordovician sequence as developed along the Chesapeake & Ohio Canal along the Potomac River in Maryland (<http://pubs.usgs.gov/pp/1691/>). We will then travel north on June 13 to examine the spectacular exposures of Ordovician carbonates in central Pennsylvania including Sandbian to early Katian rocks that contain exposures of the widely known Deicke and Millbrig super-ashfall deposits and also span the GICE interval and the associated shift from clear-water tropical carbonate faunas to the mixed carbonate-siliclastic and cool-water assemblages that inhabited Katian environments in this region. The final leg of the field trip on June 14-16 will visit the classic Taconic foreland basin succession exposed in the Mohawk and Hudson river valleys of central New York State. We will follow a shelf to allochthon transect that begins (at the western-most sites) in supratidal to deep subtidal carbonates of the Black River and Trenton groups. These rocks contain a diverse and abundant shelly fauna. To the east, at classic exposures in the central Mohawk Valley, the carbonates are replaced by the Utica Group black shales, which yield primarily graptolites and the olenid trilobite *Triarthrus*. These disparate facies were strongly influenced by extensional fault motions that created a complex facies mosaic linked together by a series of distinctive fingerprinted and dated K-bentonite beds. Finally, farther east in the Hudson Valley region we will enter a zone dominated by synorogenic flysch and mélangé that is capped by the hard-rock thrust belt



of the classic Taconic Allochthon. In this region we will examine the early Katian Snake Hill Formation greywackes with their spectacular sedimentary structures, soft bottom shelly and trace fossil faunas, as well as the late Sandbian *C. bicornis* Zone Mount Merino Formation radiolarian cherts and black shales. We will return to Harrisonburg on June 17<sup>th</sup>. Lodging, food and transportation in the field are covered in the field trip registration. Registration is expected to be approximately \$750 for a minimum of 8 and a maximum of 20 participants.

***Possible trip to Trail Creek , Idaho depending on interest***

***Leaders: Dan Goldman and Steve Leslie***

*This field trip will examine this exceptional series of exposures in the Ordovician and Silurian Phi Kappa and Trail Creek Formations in the beautiful Pioneer Mountains of central Idaho We will visit the Trail Creek Summit, Little Fall Creek, Trail Creek road, and Trail Creek (creek) sections that have yielded beautiful graptolite faunas for nearly a century. In addition to examining a graptolite succession that spans most of the Ordovician Period (Floian to Hirnantian), participants will also have an opportunity to collect abundant conodonts on bedding plane surfaces, including some bedding plane assemblages. In addition to examining outcrops that have served as biostratigraphic reference sections for western North America, participants can also enjoy the restaurants, art galleries, and pubs of Sun Valley, one of North America's premier winter ski resorts. Participants need to make their own flight arrangements to and from Idaho. Arrive Boise Idaho, June 12<sup>th</sup>. Field excursion June 13-16<sup>th</sup>. Depart Boise Idaho, June 17<sup>th</sup>. Lodging, food and transportation in the field are covered in the field trip registration. Registration is expected to be approximately \$850 for a minimum of 8 and a maximum of 12 participants. **This will be an extremely strenuous field excursion in rugged mountainous terrain that will require substantial climbing on talus slopes at elevation over ~2400 m (~7880 ft).***

**Conference Registration: ~\$325 , Student Registration \$100**

The registration fee covers the costs of publication, conference bag, coffee breaks, symposium excursion and social activities. (Ultimate costs will be determined once reservations and meeting space costs are confirmed)

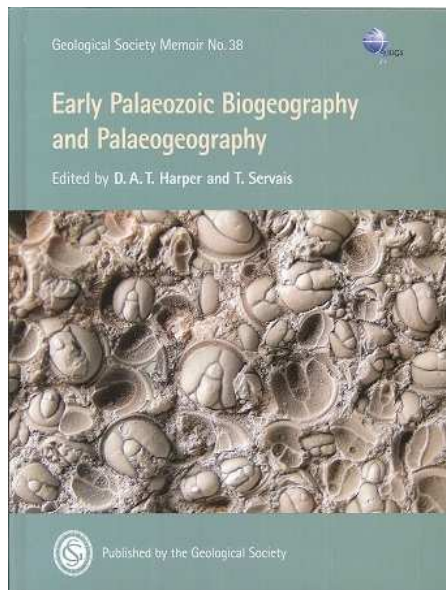
**Conference Dinner ~\$65** (Ultimate cost will be determined once reservations and location is confirmed)

**Social Program for Accompanying Partners**

The Shenandoah Valley boasts many vineyards, historic sites, and spectacular natural scenery including public caverns (<http://www.shenandoahcaverns.com/>, <http://www.grandcaverns.com/v.php?pg=15>, <http://www.luraycaverns.com> ), and Shenandoah National Park (<http://www.nps.gov/shen/index.htm>). These may be visited easily by accompanying persons and are most accessible via rental car. If there is sufficient interest trips may also be scheduled for Monticello, the home of Thomas Jefferson, author of the Declaration of Independence, third president of the United States (<http://www.monticello.org>) and Montpelier, the home of James Madison, father of the US Constitution, fourth President of the United States (<http://www.montpelier.org/>). In addition Harrisonburg is located 2 hours from the many attractions of Washington DC.

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## NEW PUBLICATIONS OF INTEREST TO ORDOVICIAN RESEARCHERS



### *Early Palaeozoic Biogeography and Palaeogeography*

Geological Society London Memoir 38

eds. D.A.T. Harper & T. Servais

ISBN: 978-18623-373-8 Published: December 2013

Hardback 496 pp

Prices: List: £125, GSL members: £62.50,

Members of other qualifying societies: £75

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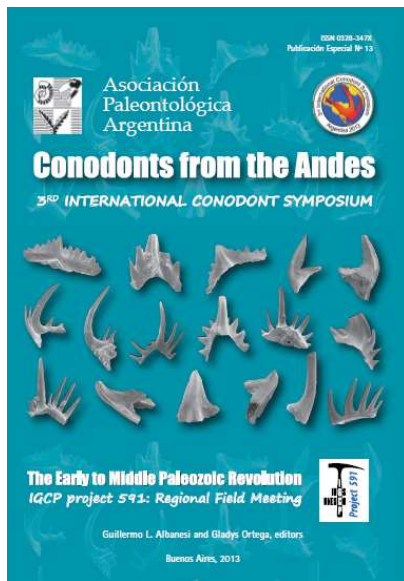
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***Conodonts from the Andes***

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Only the extended summary papers (Paleontological Notes) are listed below – the majority of which concern Ordovician topics – the volume also contains an extensive number of Abstracts of papers presented at the 3rd ICOS & IGCP Regional Field Meeting

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## Obituaries

### Professor ZHANG Wentang (1925-2013)

Prof. **Zhang Wentang**, well-known palaeontologist and geologist, and a research professor at the Nanjing Institute of Geology and Palaeontology (NIGP) died in Nanjing on October 20, 2013. He was born in Henan Province, China on January 10, 1925. He graduated from the Geology Department of Peking University in July 1948, and started his career as a stratigrapher and palaeontologist in the Institute of Geology of the Central Institution of Kuomintang (KMT) Government. He had been a research scientist at NIGP since its establishment in 1951, and dedicated more than 60 years of his career to working on Cambrian stratigraphy, trilobites and other related fields. He was a titular member of the International Subcommission on Cambrian System (ISCS) for many years, and was a member of the International Commission on Zoological Nomenclature based in London. He was also one of the editors of the revised trilobite volumes of the *Treatise of Invertebrate Paleontology*, responsible for the revision of several trilobite superfamilies.

*(Thanks to his colleagues at NIGPAS for this tribute)*

### Prof. Richard Aldridge (deceased 4th February 2014)

**Richard (Dick) Aldridge** was an eminent British palaeontologist and widely respected conodont specialist. His career began at Southampton University before moving to a temporary lectureship at University College London and then to Nottingham University where he remained until 1989 when, during the Oxburgh Review of Earth Sciences, he moved to the University of Leicester, where he was Bennett Professor of geology and served two terms as Head of Department. Dick Aldridge's research focused primarily on conodont biostratigraphy and palaeobiology and one of his seminal contributions was to uncover the vertebrate nature of the long-enigmatic conodont animal, principally in collaboration with Derek Briggs and Euan Clarkson. This was achieved through careful analysis of skeletal remains, but also through analysis of rare soft tissue remains of conodonts. His studies of conodonts in the Ordovician Soom Shale lagerstätten of South Africa were another notable research area. Prof. Aldridge was awarded the Pander Medal of the Pander society in 2006. He was President of the Palaeontological Association and received the Lapworth Medal of the PA in 2011. He also was awarded the 2012 Coke Medal of the Geological Society of London. Dick Aldridge was previously President of the Palaeontological Association and President of the International Palaeontological Association. He was a true gentleman, a great scientist and will be sadly missed.

*(adapted from biographical entry in Wikipedia, compiled by his colleagues at Leicester)*

**W.T. (Bill) Dean**, author of many Ordovician trilobite papers over the years, died in mid-February, 2014. Bill was a quiet and highly competent trilobite specialist with long-standing interests (with field projects) in Turkey, as well as continuing Whittard's earlier work on Palaeozoic stratigraphy in the Shelve Inlier and elsewhere in the Welsh Borderlands. *(Thanks to John Cope for conveying this sad news, and to Barry Webby for additional observations – no obituary was available at the time this issue of Ordovician News was being distributed).*

## **RESEARCH REPORTS & Contact details** (in alphabetical order)

**Guillermo ALBANESI (Argentina)** is participating in projects on diverse topics of historical geology from the Lower Paleozoic of South America, including conodont biostratigraphy, chemostratigraphy, events, and paleothermometry. These projects are carried out with Gladys Ortega and colleagues from universities of Argentina and other countries. He continues his project on early Paleozoic conodont faunas from the Eastern Cordillera and Puna of northwestern Argentina, in collaboration with colleagues from different universities, including M.E. Giuliano (a PhD student associated with the project for the next years). G. Voldman is undertaking research on Cambrian-Ordovician conodont biostratigraphy, paleoenvironments and paleothermometry of Argentine basins under Guillermo's supervision. He is also supervising F. Serra and N. Feltes who continue their studies (funded by CONICET scholarships) on Ordovician conodont biostratigraphy and paleoenvironments of mixed carbonate-siliciclastic sequences from the Argentine Precordillera, and undergraduate students M. Mango, G. Torre and B. Thalmeier who are developing their theses on conodont issues. Fernando Zeballo finished his post-graduate fellowship and got a new job at an oil company in Argentina.

As regional co-leader for the IGCP 591 "The Early to Middle Paleozoic Revolution", Guillermo (with other co-leaders) is guest editing a special issue of *GFF* including contributions to the annual meeting of the project held in Lund in 2013. During 2014, Guillermo is responsible for the organization of the "XIX Congreso Geológico Argentino" that will be accomplished in Córdoba, next June, and is convening a symposium on biostratigraphy, lower Paleozoic biotas and events, in cooperation with Gladys Ortega. Also this year he will participate in the 4th International Palaeontological Congress in Mendoza, Argentina.

He is the director of the "Centro de Investigaciones Geológicas Aplicadas" (CIGEA, established August 2011; <http://www.efn.uncor.edu/investigacion/CIGEA>) at the Facultad de Ciencias Exactas, Físicas y Naturales, Universidad Nacional de Córdoba, which includes a laboratory of micropaleontology especially equipped for conodont studies, in the campus installations of the Comisión Nacional de Energía Atómica (CNEA) at Córdoba. His current place of work and new office is in the CICTERRA (CONICET-UNC) at the university campus, with a repository space for the conodont collections at the Museo de Paleontología, FCEFN, UNC.

### **Guillermo L. Albanesi**

CICTERRA (CONICET-Universidad Nacional de Córdoba), FCEFN (UNC).

Casilla de Correo 1598. Córdoba 5000. Argentina

Telephone: 54-351-5353800, int. 30207

Fax number: 54-351-4332097.

E-mail address: [galbanes@com.uncor.edu](mailto:galbanes@com.uncor.edu)

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**Javier ÁLVARO (Spain)** is working in Upper Ordovician discontinuities and gaps from Morocco, Spain and France, mainly related to the onset of the Hirnantian glaciation. In collaboration with Mansoureh Ghobadi Pour and Leonid Popov, he has been supporting stratigraphic controls on shelly and microphytoplankton distribution across the Katian-Hirnantian of the Zagros Ranges.



**J. Javier Álvaro**

Centro de Astrobiología (CSIC/INTA)  
Ctra. de Torrejón a Ajalvir km 4  
28850 Torrejón de Ardoz  
Spain  
Tel: 34 915206410  
alvarobjj@cab.inta-csic.es

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**Chris BARNES (Canada)** is continuing Ordovician conodont paleontology, stratigraphy, and isotope geochemistry research. The main current projects being: a) Ordovician paleotemperature record for tracking Argentine Precordillera across Iapetus Ocean determined from SHRIMP oxygen isotope measurements from conodonts (with Julie Trotter (UWA), Ian Williams (ANU) and Guillermo Albanesi (CONICET, Cordoba)); b) completion of a study of Katian conodonts from Wales (with Annalisa Ferretti (Univ. Modena) and Stig Bergström (Ohio State Univ.)), and c) Ordovician and Silurian conodont biostratigraphy and paleoecology, Canadian Arctic Islands (with Shunxin Zhang (GSC), Jowett and Carson (PetroCanada)).

**Chris Barnes**

School of Earth and Ocean Sciences  
University of Victoria, P.O. Box 1700, STN CSC,  
Victoria, BC V8W 2Y2, Canada  
Telephone: +1-250-920-8382  
Fax: +1-250-721-6200  
E-mail: crbarnes@uvic.ca

\*\*\*\*\*

**Denis BATES (United Kingdom)** is working on the graptolite genus *Cryptograptus*, and on contributions on graptolites to the Treatise on Invertebrate Paleontology.

**Denis Bates**

Department of Geography and Earth Sciences, Aberystwyth University,  
Aberystwyth, Ceredigion SY23 3DB, United Kingdom.  
Telephone: (+44)1970617667  
E-mail: deb@aber.ac.uk

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**Juan L. BENEDETTO (Argentina)** is working on the taxonomy and phylogeny of Lower Ordovician brachiopods from the Central Andean basin of NW Argentina. The study, which includes the linguliformeans from the Santa Rosita and Acoite formations, is being carried out in collaboration with the doctoral student Diego Muñoz, who also is writing a paper jointly with me on the taxonomy and stratigraphic distribution of the punctate orthide *Lipanorthis*. Research is continuing on the Middle Ordovician brachiopod faunas from the San Juan and the Las Chacritas formations. A paper on the early colonization of deep water dysoxic marine environments in the Precordillera (Los

Azules Formation, Darriwilian) is in the final stages of preparation. In late 2013, a PhD project started focused on the taxonomy, paleoecology and biogeography of organophosphatic and craniiform brachiopods from the San Juan Formation (upper Tremadocian-Darriwilian) and other Ordovician carbonate units of the Argentine Precordillera.

**Juan L. Benedetto**

CICTERRA (Centro de Investigaciones en Ciencias de la Tierra)  
CONICET-Universidad Nacional de Córdoba  
Av. Velez Sarsfield 1611, Ciudad Universitaria  
X5016GCA - Córdoba - ARGENTINA  
jbenedetto@efn.uncor.edu

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**Matilde Sylvia BERESI (Argentina)** continues working on sponges from the Cambrian and Ordovician carbonate platforms of the Precordillera, western Argentina. A systematic paper, with Dr. J. Keith Rigby, on Middle Cambrian sponge fauna of the Precordillera of Mendoza Province has been published by *Neues Jahrbuch für Geologie und Paläontologie*. Another systematic paper on the first spicules from the Silurian of the Argentina has been published by the *Geological Journal*. A paper on the Cambrian, Ordovician and Silurian distributions of non-stromatoporoid sponges in collaboration with J. Botting, L. Muir and M. Carrera has been published by the *Geological Society London Memoir* on Early Palaeozoic Palaeobiogeography and Palaeogeography. In collaboration with colleagues of the Sonora University, we have published a systematic work on Cambrian sponges and chancellorids of Sonora, México.

I am also researching the stratigraphy, microfacies and palaeo-environmental reconstructions of Ordovician limestones of central and eastern Precordillera with S. Heredia, and A. Mestre (conodonts) from the San Juan University. We have published short papers on nautiloids and a larval gastropod assemblage associated with the *Yangtzeplacognathus crassus* Zone (Darriwilian) in several Precordilleran carbonate sections. I was actively involved in the organization of the 3rd International Conodont Symposium, held in conjunction with the IGCP 591 Regional Field Meeting, in Mendoza, Argentina, July 15-19, 2013.

**Matilde Sylvia Beresi**

Avda. Adrián Ruiz Leal s/n, Parque Gral. San Martín (5500)  
Mendoza. Argentina.  
Telephone number: 54-261-5244247  
Fax number: 54-261-5244201  
E-mail: [mberesi@mendoza-conicet.gob.ar](mailto:mberesi@mendoza-conicet.gob.ar)

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**STIG M. BERGSTRÖM (USA)** continues his global work on Ordovician conodonts, graptolites, biostratigraphy, chemostratigraphy and related subjects. Current work involves material from China, Sweden, UK, Ireland, Argentina, and North America. The past year has been very good publication-wise with 11 articles and 9 abstracts. I have had the opportunity to have great cooperation with specialists from several parts of the world during the past year and since January, 2014 Prof. Annalisa Ferretti, of Modena, Italy,

has been here for joint work on a variety of Ordovician conodont faunas. I greatly enjoyed participating in the Ordovician conference in Lund last summer where I had the opportunity to see many old friends.

**Stig M. Bergström**

Professor of Geological Sciences  
School of Earth Sciences  
Division of Geological Sciences  
The Ohio State University  
125 S. Oval Mall  
Columbus, Ohio 43210 USA  
Phone (614) 292-4473 (office); (614) 457-2588 (home)  
e-mail [Stig@geology.ohio-state.edu](mailto:Stig@geology.ohio-state.edu) Fax 614-292-1496

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**Alain BLIECK (France)** reports that last year he co-authored a paper with Ž. Žigaitė, concerned in part with Ordovician vertebrate palaeobiogeography, for the *Geological Society Memoir* 38 edited by D.A.T. Harper and T. Servais.

**Dr. Alain Blieck**

UMR 8217 "Géosystèmes" du CNRS  
c/o Université Lille 1 - Sciences et technologies  
UFR Sciences de la Terre (SN5)  
F-59655 Villeneuve d'Ascq cedex (France)  
tel. +33 320434140 ; fax: +33 320434910  
[alain.blieck@univ-lille1.fr](mailto:alain.blieck@univ-lille1.fr)

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**Carlton E. BRETT (USA)** continued to work with Steve Westrop (University of Oklahoma), Lisa Amati (SUNY at Potsdam), Patrick McLaughlin (University of Wisconsin), Ben Dattilo (Indiana-Purdue University, Ft. Wayne), Rebecca Freeman (University of Kentucky) and University of Cincinnati students on a number of Ordovician projects in eastern North America. Results of stratigraphic studies on the Upper Ordovician Sandbian to Katian strata include the following:

A) NSF-funded research with Steve Westrop and University of Oklahoma student, Rob Swisher, in 2013 focused on investigating sequence stratigraphic, geochemical, and biotic patterns through the Upper Ordovician of the mid-continent of North America. Upper Ordovician Plattin, Decorah, Kings Lake, Guttenburg, and Kimmswick in Missouri and their lateral equivalents in Oklahoma, Illinois, Iowa and Wisconsin have been subdivided into third- and fourth-order depositional sequences with the recognition of through-going sequence boundaries, maximum flooding surfaces, and systems tracts. With translation of that framework into chronostratigraphy, this study is breaking new ground in tracking litho-geochemical properties within sub-million year time slices from the ancient continental margin to the cratonic interior. Analysis of chemical gradients at this scale through a series of time slices provides insights to the redox evolution of the epicontinental sea through a series of carbon cycle perturbations (e.g., GICE and Mifflin) that are coordinated with overturn events in fossil taxa.

B) Research with UC undergraduate students, Allison Young and Alex Reis, has resulted in a detailed characterization of a portion of the lower Katian middle Lexington Limestone

near Winchester, Kentucky. Building on the previous research of Susannah Taha McLaughlin and Patrick McLaughlin, this work documents the outcrop sections with graphic logs, as well as photo mosaics, which permitted discerning subtle bedding features channels and markers and utilized this information to make a preliminary, high-resolution sequence stratigraphic analysis of the section. In addition, we measured and documented sizes and orientations of stromatoporoids and biostromes of red algae (solenoporids). This intriguing occurrence closely parallels the much later Richmondian Invasion documented by Steve Holland and Mark Patzkowsky and suggests an earlier episode of comparable warming and immigration of stromatoporoids, corals, trilobites, and other faunal elements from near equatorial regions into the subtropics.

C) Thomas J. Malgieri is completing a thesis on sequence stratigraphic and paleoenvironmental study of the lower Richmondian Stage (upper Katian) of the eastern Cincinnati Arch. In particular, this research has shown that the Bull Fork Formation is a stratigraphically complex lithostratigraphic unit that actually encompasses at least three regional disconformities. Major discoveries of this research include: a) a sequence boundary and regional truncation surface at the base of Mt. Auburn Member limestones (formerly assigned to late highstand of sequence C3 by Holland and Patzkowsky, 1996); it is reinterpreted as the transgressive systems tract (TST) of sequence C4. b) The Sunset Member (of Arnheim Formation) is a shallow marine carbonate interval, genetically related to Mount Auburn and not the beginning of a new sequence; it reflects later TST deposition and is capped by a maximum flooding surface at base of the Bull Fork Formation (= Oregonia Member of the Arnheim Formation, *sensu stricto*). The Mount Auburn passes laterally into greenish gray shales and argillaceous limestones. c) The Arnheim (C4 sequence) is terminated by a locally channeled phosphatic grainstone that marks the base of the Fort Ancient Member (of Waynesville Formation), a minor erosion surface corresponding to Holland and Patzkowsky's C4-C5 sequence boundary. d) Two widespread distinctive shale-rich intervals separated by a thin, widespread coral-bryozoan biostrome (Fisherville bed) appear to represent the Fort Ancient Member through much of northern Kentucky on both east and west sides of the Cincinnati Arch. e) A more significant unconformity occurs below greenish, silty, calcareous rarely desiccation cracked shales and argillaceous carbonates of the Rowland member (Drakes Formation). f) The basal Rowland sequence boundary is a regionally angular unconformity which truncates much of the Bull Fork (lower Waynesville and Arnheim equivalents) along the south sides of the Cincinnati Arch.

D) Research with MS student Christopher Aucoin is refining the sequence stratigraphy of the Richmondian strata along the northwest side of the Cincinnati Arch and links well with results from the east. Important results include: a) the Mount Auburn-Sunset interval is recognizable along the west side of the arch in Indiana and northern Kentucky; b) the sharp contact between a previously unnamed bundle of brachiopod-rich limestones (Southgate Bed) defines the C4-C5 sequence boundary; c) the overlying Fort Ancient Member is divisible into two major shale packages separated by a 2 meter thick bundle of brachiopod-bryozoan rich pack and grainstones (Bon Well Bed) that apparently correlates with the Fisherville Bed in the Bull Fork Formation to the south and east; d) A regionally angular discontinuity occurs between the Clarksville and Blanchester Members of the Waynesville Formation. This surface appears to be confluent with the sharp basal surface of the lower Marble Hill Bed grainstones and, in turn, with the regionally angular unconformity at the base of the Rowland Member. In addition, Aucoin is developing a depositional model for the occurrence of widespread trilobite-rich "butter shales"; these appear to be associated with pulses of mud deposition during late highstands of small-scale depositional sequences.

E) Continued research with former MS student Thomas Schramm (presently a doctoral candidate at Louisiana State University) is focused on detailed microstratigraphic and

magnetic susceptibility study of a single very well correlated interval (Z-bed and "Two-foot" shale) at the base of the Maysvillian Stage in Ohio, Kentucky, and Indiana. Fieldwork was largely completed during 2013. The premise of this study is to test the notion that there are systematic changes in magnetic susceptibility along a proximal-distal gradient with overall higher values in upramp sections near to areas of influx of detrital sediment. In addition, sampling for magnetic susceptibility profiles in the Sandbian-basal Katian interval was completed in summer 2013 by Schramm; results will aid in testing alternative sequence correlations of Cincinnati Arch and Nashville Dome successions with those in the classic New York section.

Edited and updated versions of the following field guides on Ordovician and Silurian strata from the 2012 IGCP 591 Foerste Meeting are available on-line at the IGCP 591 website (<http://www.igcp591.org/meetings.php>.)

- 1) Brett, C.E., McLaughlin, P.I., Schramm, T.J., Sullivan, N.B., and Thomka, J.R. 2012. Middle Paleozoic Sequence Stratigraphy and Paleontology of the Cincinnati Arch: In, Brett, C.E., Cramer, B.D., and Gerke, T. L. Editors. Part 1. Central Kentucky and Southern Ohio. *International Geoscience Programme (IGCP) Project 2<sup>nd</sup> Annual Meeting and 1<sup>st</sup> Foerste Symposium, Guidebook*, University of Cincinnati, Cincinnati, OH. 160 p.
- 2) Brett, C.E., Cramer, B.D., Datillo, B. F., McLaughlin, P.I., Schramm, T.J. and Thomka, J.R. 2012. Middle Paleozoic Sequence Stratigraphy and Paleontology of the Cincinnati Arch: In, Brett, C.E., Cramer, B.D., and Gerke, T. L. Editors. Part 2. Northern Kentucky and SE Indiana. *International Geoscience Programme (IGCP) Project 2<sup>nd</sup> Annual Meeting and 1<sup>st</sup> Foerste Symposium, Guidebook*, University of Cincinnati, Cincinnati, OH, 94 p.

**Carlton E. Brett**

Department of Geology, University of Cincinnati,  
Cincinnati, OH 45221-0013 USA  
Telephone: 001 513 556-4556  
Fax: 001 513 556-6931  
E-mail: [carlton.brett@uc.edu](mailto:carlton.brett@uc.edu)

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**Yves CANDELA (Scotland)** is still working on brachiopods, but a couple of papers are due out this year dealing with other phyla: (1) an occurrence of a polyplacophoran from the Kirkcolm Formation, Kilbucho, Scotland (with Lesley Cherns [Cardiff University] and Lore Troalen [NMS]) and (2) machaeridians from the Pentland Hills, Scotland (Silurian) (this includes a redescription of Archie Lamont's specimens) with Bill Crighton [NMS]. The work I undertook with David Harper (Durham University) on brachiopod biofacies from the Barr and Lower Ardmillan groups of the Girvan district (SW Scotland) (see last year's edition of the Ordovician News), is also due out this year (hopefully around Spring). I am still working, with David Harper, on a project destined to review relationships within the Plectambonitoidea superfamily, using the cladistic method. I continue working on brachiopod faunas from Laurentia, and a paper entitled "Evolution of brachiopod faunas around Laurentia during the Ordovician" was submitted earlier this year (2014).

I am currently working on the description of a brachiopod fauna (linguliform) from the Glenkiln Shales (Sandbian), along the Wandel Burn and its attributes, SE Scotland.

**Yves Candela**

Department of Natural Sciences  
National Museums Scotland  
Chambers Street  
EDINBURGH EH1 1JF, U.K.  
Tel +44 (0)131 247 4280  
e-mail: [y.candela@nms.ac.uk](mailto:y.candela@nms.ac.uk)

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**Marcelo G. CARRERA (Argentina)** is actively working on the evolutionary history of lower Paleozoic sponges and the taxonomy, paleoecology and paleobiogeographic significance of the bryozoan fauna of the Argentine Precordillera.

**Marcelo G. Carrera**

CICTERRA-CONICET Facultad Ciencias Exactas Físicas y Naturales,  
Universidad Nacional de Córdoba  
Av. Velez Sarsfield 299 (5000) Córdoba, Argentina  
Telephone (IP phone): 5353800 (office code 30222)  
Fax: =54-351-4332097  
E-mail: [mcarrera@efn.uncor.edu](mailto:mcarrera@efn.uncor.edu)

\*\*\*\*\*

**Chen Xu**

Key Laboratory of Economic Stratigraphy & Palaeogeography (CAS)  
State Key Laboratory of Palaeobiology & Stratigraphy  
Nanjing Institute of Geology & Palaeontology,  
Chinese Academy of Sciences  
39 East Beijing Road, Nanjing, P.R. China  
Tel. & Fax. 0086-25-83375157 (Office)  
Mobile 13512511007  
Email [xuchen@nigpas.ac.cn](mailto:xuchen@nigpas.ac.cn)

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**Carlos CINGOLANI (Argentina)** continues working on sedimentary provenance and tectono-stratigraphic evolution of Lower to Middle Palaeozoic sequences from the Argentine Precordillera-Cuyania terrane and Paraná basin (Eastern Paraguay). Isotope geology and geochronology on detrital minerals (mainly zircons) are the main tools used for provenance analysis in documented stratigraphic sequences. A PhD thesis (P. Frigerio) based on sedimentary provenance of the Lower Palaeozoic of the Jagué region (Northern Precordillera) was examined and approved during 2013 at the University of La Plata. Isotopic studies on the Ordovician K-bentonites of the Precordillera and equivalent Famatinian magmatism are in progress (A. Bidone) as a PhD thesis.

**Carlos A. Cingolani**

Universidad Nacional de La Plata-CONICET  
Paseo del Bosque,1900-La Plata (Argentina)  
TEL 0054 0221 4215677-0054 0221 4257744 (int. 127)  
e-mail: cingola@museo.fcnym.unlp.edu.ar, ccingola@cig.museo.unlp.edu.ar,  
carloscingolani@yahoo.com

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**Robin COCKS (England)** has had another busy year, working partly on Ordovician and Silurian brachiopods and partly on palaeogeography with Trond Torsvik. The *Special Paper in Palaeontology* on Katian and Hirnantian brachiopods from south-western Wales was revised and will be published in April 2014. The other substantial paper, on Katian and Hirnantian brachiopods from the Chinghiz Terrane, Kazakhstan, with Leonid Popov, is now in proof. During the year papers on Aeronian spiriferids from Iran (also with Leonid Popov) and on global Aeronian brachiopod distributions (with Rong Jiayu) have been completed. A palaeogeographical survey of Gondwana from the Cambrian onwards with Trond was started, completed, accepted and published in *Gondwana Research* during the year. Current work includes the start of a monograph on Aeronian and Telychian brachiopods of the Welsh Borderland (my original doctoral topic, but then I completed only the strophomenides), but that will not be finished soon. There were two visits to Oslo to work with Trond and also attendance at the Lund meeting, where I gave a paper on Gondwana.

**L. Robin M. Cocks**

Department of Earth Sciences, The Natural History Museum  
Cromwell Road, London SW7 5B U.K.  
Tel. 0047 (0)20 7942 5140  
e-mail r.cocks@nhm.ac.uk

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**Roger COOPER (New Zealand)**, in collaboration with James Crampton and Peter Sadler, is using taxon survivorship analysis of graptoloids to test for age-selectivity of extinction through the Ordovician and Silurian. A link between global climatic events and graptoloid extinction episodes is proposed in a paper with Sadler, Munnecke and Crampton (*Geol. Mag.*), available in pre-publication form. Two collaborative works - with Ian Percival, Yong-Yi Zhen and John Simes, and with John Pojeta and John Simes - on NZ Cambrian and Ordovician microfossils are in press with *Memoirs of the AAP*.

**Roger Cooper**

GNS Science, PO Box 30368,  
Lower Hutt, NZ  
Ph +4 5704853  
[r.cooper@gns.cri.nz](mailto:r.cooper@gns.cri.nz)

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**John COPE (UK):** Nothing in the way of Ordovician news to report since I've been too preoccupied with Jurassic projects of late.

**John C.W. Cope**

Department of Geology,  
National Museum of Wales,  
Cathays Park,  
Cardiff CF10 3NP UK  
Tel. 44 (0) 29 2057 3164  
email: john.cope@museumwales.ac.uk

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**Helena COUTO (Portugal)** is working on the study of Palaeozoic stratigraphy, palaeontology and gold-antimony mineralization in the area of Valongo Anticline (North Portugal). These studies aim contributing for a better knowledge of the Palaeozoic stratigraphy and to define prospecting guides for gold. Geological mapping, petrographic, geochemical and stratigraphic studies go on being developed on the Cambrian-Ordovician transition, Lower and Middle Ordovician, on the Upper Ordovician deposits related to the Late Ordovician glaciation and on Silurian-Devonian transition.

**Helena Couto**

Department of Geosciences Environment and Management,  
Faculty of Sciences, University of Porto  
Geology Centre, University of Porto  
Rua do Campo Alegre 687  
4169-007 Porto  
Portugal  
tel +351 22 0402489/69  
hcouto@fc.up.pt

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**G. Susana DE LA PUENTE (Argentina)** continued in 2013 to focus on chitinozoans of the Ordovician and Silurian successions from Argentina. I have recently moved to Neuquén (Argentina) where I still work as a scientific researcher for CONICET of Argentina, concentrating on the same topics while under the direction of Dr. Claudia Rubinstein as well. Additionally I have started to collaborate as an Assistant Professor in the Geology Department at the Universidad Nacional del Comahue (Neuquén, Argentina). I am actively involved in the organization of the 4th International Palaeontological Congress, to be held this year, from September 28th to October 3rd, 2014 in Mendoza, Argentina <<http://www.ipc4mendoza2014.org.ar/>>

**Graciela Susana de la Puente**

CONICET – Departamento de Geología y Petróleo, Facultad de Ingeniería  
Universidad Nacional del Comahue (UNCo)  
Buenos Aires 1400  
Q8300IBX Neuquén  
ARGENTINA  
Phone: 54-299-4490368 / 4490350



Fax: 54-299-4488304

E-mail: [sudelapuenta@gmail.com](mailto:sudelapuenta@gmail.com)

*Note: These contact details are new this year.*

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**Andrei DRONOV (Russia)** continued his work on facies, sea-level changes and biotic events on the Russian and Siberian platforms during the Ordovician. In the year 2013 we started a new 3- year project “Influence of eustatic sea-level changes on dynamics of biodiversification in the Ordovician paleobasins (comparative analysis of data from the Siberian and Russian platforms). The project’s team includes Alexaner Kanygin, Taras Gonta, Alexandr Timokhin, Anastasia Yadrenkina, Olga Maslova, Veronica Kushlina, Elena Raevskaya and Tatiana Tolmacheva.

I am also involved into investigation of the Ordovician trace fossils in cooperation with Radek Mikuláš. Together with Birger Schmitz we study distribution of extraterrestrial chromites in the Darriwilian sections of St. Petersburg region and Siberia. The studies of K-bentonite beds from the Upper Ordovician of Siberian platform are conducted in collaboration with Warren Huff and Bryan Sell as well as Christian Rasmussen and David Harper.

**Andrei V. Dronov**

Geological Institute

Russian Academy of Sciences

Pyzhevsky per.7

119017 Moscow

RUSSIA

Tel.: +7 (495) 959-30-17

Fax: +7 (495) 959-07-60

E-mail: [dronov@ginras.ru](mailto:dronov@ginras.ru)

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**Jan Ove EBBESTAD (Sweden)** is continuing with studies on the Ordovician of the Siljan impact craters in collaboration with th research group of Oliver Lehnert (Erlangen), Björn Kröger (Helsinki) and Anette Högrström (Tromsö). Also this summer I will look at the Tremadocian Ceratopyge Limestone in northern Sweden in collaboration with Åsa Frisk (Uppsala). The chapter on biogeography of Ordovician and Silurian gastropods, monoplacophorans and mimospirids came out in the *Geological Society of London Memoir*, and will hopefully serves asa guideline for further research. To follow up this, a number of taxonomic studies on Ordovician gastropods and tergomyans that have been on hold should be finished this year.

**Jan Ove R. Ebbestad**

Museum of Evolution, Uppsala University,

Norbyvägen 16, SE 752 36 Uppsala, Sweden

Telephone: +46184712709

E-mail: [jan-ove.ebbestad@em.uu.se](mailto:jan-ove.ebbestad@em.uu.se)

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**Bob ELIAS (Canada)**, together with Graham Young, Godfrey Nowlan and students, is continuing to study the Upper Ordovician and Ordovician-Silurian boundary interval in the Williston and Hudson Bay basins of central North America. Ongoing M.Sc. thesis research by Matt Demski is focussed on the boundary interval in the Williston Basin area of southern Manitoba and Saskatchewan.

A paper by Ning Sun, Bob and Dong-Jin Lee, on the biological affinity of *Amsassia* with new evidence from the Ordovician of North China, has been accepted for publication in *Palaeontology*. Papers on various tabulate corals from Estonia and China are in preparation with Kun Liang, Dong-Jin, Mari-Ann Mötus and Boo-Young Bae.

**Bob Elias**

Department of Geological Sciences, University of Manitoba,  
Winnipeg, Manitoba, Canada R3T 2N2  
Telephone: (204) 474-8862  
Fax: (204) 474-7623  
E-mail: eliasrj@cc.umanitoba.ca

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**Annalisa FERRETTI (Italy)**: My Ordovician research continues to be focused on conodont faunas from Europe and elsewhere, conducting cooperative research with Stig Bergström on conodonts from different localities in UK, the Carnic Alps (with Hans Peter Schönlaub) and the United Arabian Emirates (with Giles Miller). A rich Katian conodont fauna from the Sholeshook Limestone Formation (Wales) has been recently described (Ferretti, Bergström & Barnes) and a study on well preserved conodont material from the Keisley Limestone (England) has been completed (Bergström & Ferretti). Enigmatic fossilized ring-like structures with unknown function and taxonomic affiliation are described from conodont residues in the Upper Ordovician of the Carnic Alps and the Silurian of Bohemia (Ferretti, Cardini, Crampton, Serpagli, Sheets & Storch).

**Annalisa Ferretti**

Dipartimento di Scienze Chimiche e Geologiche  
Università degli Studi di Modena e Reggio Emilia  
l.go S. Eufemia 19  
41121 MODENA (Italy)  
Telephone: ++39-059-2055868  
Fax number: ++39-059-2055887  
E-mail: ferretti@unimore.it

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**Stanley C. FINNEY (USA)** reports that serving as Chair of ICS consumes most of the time that I would otherwise devote to research, yet my experience with Ordovician stratigraphy and the Ordovician Subcommittee serves me well in that role. The highlight of 2013 for me was STRATI 2013 - 1st International Congress on Stratigraphy. To participate in a large meeting that was all stratigraphy and the full range of stratigraphy was most enjoyable. The 2nd International Congress on Stratigraphy, STRATI 2015, will be held in Graz, Austria in July 2015, and I expect it to be a much larger event. I was pleased to learn of the successful combined Cambrian-Ordovician-Silurian meeting in Lund, Sweden in 2013 and wish I could have attended. Other my

recent papers have dealt with matters other than the Ordovician (ICS International Chronostratigraphic Chart, the Anthropocene, and the nature of GSSPs). I am revising and soon hope to submit a paper on a structural geology interpretation that could only have been developed by using graptolite and conodont biostratigraphy to unravel the structures within the Roberts Mountains allochthon. Its title is "Tectonic Erratics - remarkable exotic blocks emplaced by the Henderson thrust, Eureka County, Nevada".

**Stanley C. Finney**

Chair - International Commission on Stratigraphy  
Professor, Department of Geological Sciences  
California State University - Long Beach  
Long Beach, CA 90740 USA  
Stan.Finney@csulb.edu

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**Richard FORTEY (U.K.)** continues to work at the Natural History Museum two days a week emeritus. The big news for me in 2013 was the publication of a substantial monograph on the early Ordovician trilobites of Spitsbergen from the Kirtonryggen Formation (Tremadocian-early Floian). This work completes a series of papers I began more than forty years ago! Spitsbergen has probably the most complete, and richest succession of trilobite faunas on the eastern (present day) side of the Laurentian platform, with different species from those in the Great Basin, which are under study by J. Adrain and colleagues. The succession of Kirtonryggen species helps to clarify some of the older trilobite literature based on small collections from Greenland, mostly described by C. Poulsen. Although there is no silicification, preservation is generally good. I also continue to study Ordovician trilobites from Morocco when they become available to me.

**Richard Fortey**

Department of Earth Sciences, The Natural History Museum  
Cromwell Road, London SW7 5B U.K.

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**Mansoureh GHOBADI POUR (Iran)** is currently working on the Ordovician of Iran and Central Asia, as well as general trilobite taxonomy, biostratigraphy, paleobiogeography, paleoclimate and biofacies. My ongoing research projects include studies of the Tremadocian-Darriwilian trilobites of the eastern Alborz Mountains in northern Iran, Mid to Late Ordovician brachiopods and trilobites of the Anarak Region in Central Iran and the Katian trilobites and brachiopods from High Zagros in south-eastern Iran. I also continue my cooperation with Irina Kim (Geological Survey of Uzbekistan) in studies of the trilobites and brachiopods from the Obikalon, Obikanda, Chashmankolon and Archalyk beds of the Zerafshan Range.

**Mansoureh Ghobadi Pour**

Department of Geology, Faculty of Sciences,  
University of Zanjan, University Boulevard,  
45371-38791, Zanjan, Iran  
Mobile: +98 913 2654300  
E-mail: [mghobadipour@yahoo.co.uk](mailto:mghobadipour@yahoo.co.uk)

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**Karen HALPERN (Argentina)** is writing a Ph.D thesis on the Late Ordovician Extinction in the Argentine Precordillera, supervised by Marcelo Carrera. My research is mostly focused on brachiopods communities from the upper Ordovician and early Silurian, and I am interested particularly in paleoecological issues that are in response to environmental changes during this biotic event.

**Karen Halpern**

Lic. Biología Or. Paleontología  
CICTERRA (CONICET y Universidad Nacional de Córdoba)  
Velez Sarfield 1611 - Córdoba Capital (5000) - Argentina  
+54-351-5353800 INT #30212  
<http://www.cicterra-conicet.gov.ar/>

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**David A.T. HARPER (UK)**. Research is continuing on Ordovician stratigraphy and faunas in Scotland (with Yves Candela, Euan Clarkson and Alan Owen; a paper revising the brachiopod identifications of the Barr and Lower Ardmillan faunas, led by Yves, is now in press in the *Transactions of the Royal Society of Edinburgh: Earth Sciences*), Ireland (George Sevastopulo, Svend Stouge and John Murray; a manuscript will be submitted shortly on the enigmatic conodont fauna from the allochthonous limestone blocks in the Rosroe Formation, western Ireland), and Greenland (with Jan Audun Rasmussen, Christian Mc Ørum Rasmussen, Jin Jisuo and Svend Stouge). A large monograph on the late Ordovician and early Silurian brachiopods faunas from South China with Rong Jiayu, Zhan Renbin and Huang Bing was published in *Special Papers in Palaeontology*. Work continues on the Ordovician of southern Tibet and Xinjiang with Zhan Renbin (Nanjing), Liu Jianbo (Beijing), Lars Stemmerik and Svend Stouge (Copenhagen), with a recent paper on the Tibet brachiopods published in *Palaeontology*. And together with Jorge Colmenar and Enrique Villas, a new look at the distribution of the brachiopod *Svobodaina*, using digitized images of the species, was published in *Palaeontology*. Research is ongoing into the causes of the end Ordovician extinction event with Howard Armstrong, Seth Finnegan, Jin Jisuo, Christian Rasmussen and Peter Sheehan (a paper with Howard is in press in GSA Special Papers). In early 2013, Dave Harper and Thomas Servais completed editing the c. 30 manuscripts that address the relationships between biogeography and palaeogeography in the Early Palaeozoic. This seminal volume, Early Palaeozoic biogeography and palaeobiogeography, was published at last in late 2013 as Geological Society, London Memoir 38. The project turned out to be much more extensive and time-consuming than initially expected, but we hope the book will be a landmark publication in Lower Palaeozoic research.

**David A.T. Harper**

Principal of Van Mildert College  
Professor of Palaeontology  
Department of Earth Sciences  
Durham University  
Durham DH1 3LE, U.K.

Tel. 0044 1913347143  
Fax 0044 1913345991  
Mobile 0044 7900607167  
E mail david.harper@durham.ac.uk

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**Susana HEREDIA (Argentina)** is working on taxonomy and biofacies of Middle Ordovician conodonts (*Lenodus variabilis* to *Eoplacognathus suecicus* zones) in the Central Precordillera, especially the taxonomy of the genus *Eoplacognathus*. Lower and Upper Ordovician conodonts from Precordillera are still under study. Research continues with Josefina Carlorosi on Lower-Middle Ordovician key conodonts from North Western Argentina.

Susana shares interests on Ordovician matters with Ana Mestre, Graciela Sarmiento, Matilde Beresi, Guillermo Aceñolaza, Josefina Carlorosi, Andrea Bidone, Gilberto Aceñolaza, Tatiana Soria, Cintia Kauffman and Galina Nestell.

**Susana Heredia**

Laboratorio de Micropaleontología  
CONICET- IIM - Facultad de Ingeniería  
Universidad Nacional de San Juan  
Urquiza y Libertador  
5400-San Juan  
Argentina  
E-mail address: sheredia@unsj.edu.ar

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**Linda HINTS (Estonia)** is working on Ordovician brachiopods and stratigraphy from the East Baltic. Special attention is paid to the development and stratigraphy of the Katian reefs in Northern Estonia in collaboration with Björn Kröger.

**Linda Hints**

Institute of geology at Tallinn University of Technology  
Ehitajate tee 5, 19089, Tallinn  
Estonia  
[linda.hints@ttu.ee](mailto:linda.hints@ttu.ee)

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**Olle HINTS (Estonia)** is continuing studies on Ordovician-Silurian microfossils (scolecodonts, chitinozoans, conodonts), geochemistry and Baltic regional geology and stratigraphy. In collaboration with Mats E. Eriksson (Lund) and Petra Tonarova (in Tallinn for postdoc) several projects on Paleozoic scolecodonts are in progress. A chapter on polychaete paleobiogeography was published in the Geological Society Memoir "Early Palaeozoic Biogeography and Palaeogeography". Together with Liina Paluveer, Jaak Nõlvak and Viuu Nestor he is involved in compiling distributional database of Baltoscandian microfossils and analysing it with quantitative stratigraphic tools, especially CONOP9. In collaboration with Yanan Shen (Hefei, China) Late Ordovician sulfur isotope record from was obtained from the Viki reference drill core, western Estonia. These data alongside with carbon isotope curve and biostratigraphy were

presented at the IGCP 591 Annual Meeting in Lund, and a paper was submitted to the GFF special volume (<http://dx.doi.org/10.1080/11035897.2013.873989>).

**Olle Hints**

Institute of Geology at Tallinn University of Technology  
Ehitajate tee 5, 19086 Tallinn  
Estonia  
+372 513 01 57 (office and mobile)  
[olle.hints@ttu.ee](mailto:olle.hints@ttu.ee)

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**Warren HUFF (USA)** is involved in several collaborative projects with European colleagues. With Oliver Lehnert and Guido Meinhold we are studying Paleozoic k-bentonites in drill cores from the Siljan impact structure. This is the largest known impact structure in Europe and the relict of the late Devonian Siljan meteorite crater in central Sweden. Three cores, provided by the private Swedish company Igrene AB, include more than 1500 m of Proterozoic basement and strata ranging from the late Tremadocian to Wenlock in age. Our work is focused on the mineralogy and geochemistry of a number of Ordovician and Silurian K-bentonites with the intent to explore possible correlations with previously described K-bentonites throughout Baltoscandia. By comparison, the Middle Ordovician section at Röstånga in Scania contains eighteen K-bentonite beds ranging from 1-67 cm in thickness, and all occur within the *D. multidens* graptolite biozone. Several beds at Röstånga correlate equally well with the Kinnekulle bed and thus argue strongly for the composite nature of what is called the Kinnekulle K-bentonite. We suggest the same for the equivalent sequence in the Siljan cores. With Andrei Dronov we are studying samples from the Dolborian Regional Stage (middle to upper Katian) from the outcrop on Bolshaya Nirunda River, the tributary of Podkamennaya Tunguska. It is about 300 km to the east from Yenisei River. The continental margin during the Ordovician was about 200 km to the west from the position of the Yenisei River and the volcanic arc was probably even further to the west. So we estimate the minimal distance from the source of volcanic ash was no less than 500-600 km. We are currently generating zircon ages plus acquiring trace element data from biotites and apatites to refine the chemostratigraphic correlation of these beds over the 25 km known outcrop area.

**Warren D. Huff**

Department of Geology  
University of Cincinnati  
PO Box 210013  
Cincinnati, OH 45221-0013  
Voice: 513-556-3731  
Fax: 513-556-6931  
Email: [warren.huff@uc.edu](mailto:warren.huff@uc.edu)

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**Anna KOZŁOWSKA (Poland)** is working mostly on Silurian graptolites, but has recently described graptolites from the lower Ordovician of China (together with Jörg Maletz). The main focus of my research is evolution of retiolitids (Retiolithina). The

graptolites are isolated and come from Poland, in boreholes and erratic boulders. I cooperate with Alf Lenz, Denis Bates, Mike Melchin and Sigitas Radzevičius studying graptolites from Arctic Canada and Lithuania. I am working with Adam Urbanek and my PhD students Kinga Dobrowolska and Dagmara Chmielarz studying monograptids from Polish boreholes.

**Anna Kozłowska**

Institute of Paleobiology  
Polish Academy of Sciences  
ul. Twarda 51/55  
00-818 Warszawa  
Telephone number (4822) 6978872  
Fax number (4822) 6206225  
[akd@twarda.pan.pl](mailto:akd@twarda.pan.pl)

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**Petr KRAFT (Czech Republic)** continued his studies on graptolites from the Prague Basin, Czech Republic, and New South Wales, Australia (together with Ian Percival). I also continued field work on a small project in the West Bohemian Museum focused on temporary and protected paleontological localities in the Ordovician of the Prague Basin. Together with my student Karolína Lajblová we finished two studies on the Middle Ordovician ostracods from the Prague Basin, one of them in co-operation with Tonu Meidla (Estonia).

**Petr Kraft**

Charles University in Prague  
Faculty of Science, Institute of Geology and Palaeontology  
Albertov 6  
128 43 Praha 2  
Czech Republic  
tel.: +420 22195 1459  
e-mail: [kraft@natur.cuni.cz](mailto:kraft@natur.cuni.cz)

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**Stephen LESLIE (USA)** is primarily working on Middle and Late Ordovician conodont biostratigraphy and integrating the biostratigraphy with studies of Ordovician paleoclimate change. He is collaborating with Achim Herrmann (Louisiana State University) and Ken MacLeod (University of Missouri) in testing the early Late Ordovician cool water carbonate hypothesis in the North American Midcontinent using oxygen isotopes from conodont apatite. Steve and Matt Saltzman (The Ohio State University) are working on a project related to Sr and Nd isotope stratigraphy of the Ordovician, particularly focused on the continuity of deposition through the Darriwilian and Early Sandbian in the Central Appalachians. This research is collaborative with Stig Bergstrom, Ken Foland, Alyssa Bancroft, and Amanda Howard (The Ohio State University), as well as John Repetski (USGS) and Seth Young (Indiana University). Steve is also working with Bryan Sell (University of Michigan), Chuck Mitchell (University of Buffalo), and Scott Samson (Syracuse University) to integrate K-bentonite fingerprinting with biostratigraphy in the upper Sandbian and lower Katian. Another

current project involves the integration of graptolite and conodont biostratigraphy in dark shale successions, with Dan Goldman (University of Dayton) providing the graptolite input. A study with Mike Pope (Texas A & M) and GSC Calgary is investigating Late Ordovician – Early Silurian sequence stratigraphy and conodont biostratigraphy in the Northwest Territories of Canada.

**Stephen A. Leslie**

Department of Geology and Environmental Science  
James Madison University  
395 South High St., MSC 6903  
Harrisonburg, VA 22807 USA  
Phone: 540-568-6144  
Fax: 540-568-8058  
e-mail: [lesliesa@jmu.edu](mailto:lesliesa@jmu.edu)

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**Lixia LI (China)** continues to work on the Ordovician graptolites from South China. My research is mainly focusing on graptolite taxonomy, palaeoecology, biostratigraphy, and its macroevolutionary trends. Currently, I am doing postdoctoral studies at NIGPAS, Nanjing, China.

**Lixia Li**

Nanjing Institute of Geology and Palaeontology,  
Chinese Academy of Sciences  
39 East Beijing Road, Nanjing 210008, China  
Telephone: +86-25-83282147  
E-mail: [lilixia1015@gmail.com](mailto:lilixia1015@gmail.com)

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**Anita LÖFGREN (Sweden)** continues working on Early and Middle Ordovician conodonts from Baltoscandia.

**Anita Löfgren**

Lund University, Geological Institution,  
Department of Geology, Sölvegatan 12, SE- 223 62 Lund,  
Sweden  
Telephone: +46-46-152406  
E-mail: [anita.lofgren@geol.lu.se](mailto:anita.lofgren@geol.lu.se)

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**Elena LYKOVA (Bukolova) (Russia)** is working on Ordovician graptolites from Gorny Altay (South of West Siberia).

**Elena Bukolova**

Trofimuk Institute of Petroleum Geology and Geophysics  
Siberian Branch of RAS  
Acad. Koptyug av., 3



630090, Novosibirsk,  
Russia  
Tel: +7 (383) 333-24-31  
Fax: +7 (383) 333-23-01  
E-mail address: [BukolovaEV@ipgg.sbras.ru](mailto:BukolovaEV@ipgg.sbras.ru)

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**Jörg MALETZ (Germany)** is working on a number of projects, the most important of which are the Graptolite Treatise and a book on Graptolites (Topics on Palaeobiology Series). Research on Cambrian and Ordovician pterobranchs is in progress with Michael Steiner (FU Berlin, Germany) as part of the DFG Forschergruppe 736 'The Precambrian-Cambrian ecosphere (R)evolution: Insights from Chinese microcontinents'. Some results will be published in *PPP*398 (15. March 2014) as a special issue with the title 'The Cambrian Bioradiation Event: A Chinese Perspective'. Work on the sedimentology of the Middle Ordovician successions of western Newfoundland is in progress with Sven Egenhoff and students at Colorado State University, Fort Collins, CO.

**Jörg Maletz**  
Freie Universität Berlin  
Institut für Geologische Wissenschaften  
Malteserstr. 74-100 Haus B, Raum 322  
D-12249 Berlin  
Germany  
Phone: +49 30 838 70678  
e-mail: [yorge@zedat.fu-berlin.de](mailto:yorge@zedat.fu-berlin.de)

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**Peep MÄNNIK (Estonia)** is working on evolution, taxonomy and palaeoecology of conodonts, conodont-based high-resolution stratigraphy, bioevents and palaeogeography. He is also interested in sequence stratigraphy and evolution of sedimentary basins. His studies continue under project "Quantitative stratigraphical approach to early Palaeozoic chitinozoans and conodonts of the Baltic area: high-resolution time scales and palaeobiodiversity". A new four-year project, "Environmental and faunal changes in the pre-Hirnantian Late Ordovician: a prelude to the end-Ordovician mass extinction? A Baltoscandian perspective", starts in this year. Also, joint studies together with colleagues from Estonia, Germany, Iran, Russia, Sweden, U.K. and USA on evolution and high-resolution stratigraphy of the Early Palaeozoic faunas and sedimentary basins on different palaeocontinents are ongoing.

**Peep Männik**  
Institute of Geology at Tallinn University of Technology  
Ehitajate tee 5  
19086 Tallinn  
Estonia  
tel.: + 372 58845082  
fax: + 372 6203011  
e-mail: [peep.mannik@ttu.ee](mailto:peep.mannik@ttu.ee)

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**Alexander (Sandy) D. McCracken (Canada)** continues to work on Middle to Upper Ordovician, Silurian and Devonian and conodonts from various locations in Canada. He is concentrating on good collections from Hudson Bay and Moose River basins, Ontario and Manitoba.

**Alexander (Sandy) D. McCracken**  
Geological Survey of Canada  
3303-33rd St. NW, Calgary, Alberta T2L 2A7  
Canada  
Telephone 1-403-292-7130  
E-mail [samccrac@NRCan.gc.ca](mailto:samccrac@NRCan.gc.ca)

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**Tõnu MEIDLA (Estonia)** is actively working on several aspects of Ordovician and Silurian ostracods from the Baltic area and Canada, in cooperation with M. Williams, O. Tinn, V. Perrier and K. Truuver.

**Tõnu Meidla**  
Institute of Ecology and Earth Sciences, University of Tartu,  
14A Ravila Street, Tartu 50411, Estonia  
phone: +372 737 5895  
[Tonu.Meidla@ut.ee](mailto:Tonu.Meidla@ut.ee)

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**Michael J. MELCHIN (Canada)** is currently working on several projects related to graptolite biostratigraphy and biodiversity as well as chemostratigraphy through the Late Ordovician and Early Silurian, particularly in North America, Europe, and China. I am collaborating with Charles Mitchell, David Sheets and Petr Storch, on the study of Late Ordovician–Early Silurian faunas in Bohemia, Scotland, and Fan Junxuan and Chen Xu on the study of Rhuddanian–early Telychian graptolites from South China, including two potential GSSP candidate sections. I am working on a project with Dan Goldman, Chuck Mitchell, Fan Junxuan and others on quantitative graptolite biogeography. My masters student, Peter Bullock has recently completed his study of the C and N isotope geochemistry of some mid-Llandovery graptolites from Arctic Canada and a paper on that work is in preparation. I have been working with Alf Lenz and Anna Kozłowska on some isolated Llandovery graptolites. I am also expanding my research interest in the distribution, geochemistry, and origin of black shales in Ordovician-Silurian time.

**Michael Melchin**, Professor and Chair  
Department of Earth Sciences  
St. Francis Xavier University  
Antigonish, Nova Scotia, Canada B2G 2W5  
Phone: 902-867-5177 Fax: 902-867-2414  
E-mail: [mmelchin@stfx.ca](mailto:mmelchin@stfx.ca)

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**Michal MERGL (Czech Republic)** is now actively working on several aspects of middle Devonian brachiopods, especially of Eifelian age. My Ordovician interests concern effaced trilobites of the early Ordovician (manuscript now submitted), and odontopleurid trilobites of Katian age (manuscript accepted), all of Bohemian provenance. My continuing hobby is focused on organophosphatic brachiopods from the Ordovician to Devonian, concentrating now on evolution of the discinid *Schizocrania*. I will be happy for any (especially unpublished) reports concerning this genus. For my pdf reprints please visit [http://www.kbi.zcu.cz/OB/zam/mer\\_data/w\\_PUB\\_14.htm](http://www.kbi.zcu.cz/OB/zam/mer_data/w_PUB_14.htm)

**Michal Mergl**

Centre of Biology, Earth and Environmental Sciences

Faculty of Education, University of West Bohemia

Plzeň, 30619, Czech Republic

Telephone: +420 377 363 240

Mobil: +420 606 665 122

E-mail: [mmergl@cbg.zcu.cz](mailto:mmergl@cbg.zcu.cz) Note change of my e-mail address from mid-2013

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**Ana MESTRE (Argentina)** is working on stratigraphy, biostratigraphy, taxonomy and biofacies of Middle Ordovician conodonts (*Lenodus variabilis* to *Eoplacognathus pseudoplanus* zones) in the Argentina Precordillera. Lower Ordovician conodonts from Precordillera are still under study. Ana shares interests on Ordovician matters with Susana Heredia, Graciela Sarmiento, Matilde Beresi, Josefina Carlorosi, Tatiana Soria, Cintia Kauffman, Andrea Bidone, Galina Nestell and Michael Stamatakis.

**Ana Isabel Mestre García**

Laboratorio de Micropaleontología

CONICET- IIM - Facultad de Ingeniería

Universidad Nacional de San Juan

Urquiza y Libertador

5400-San Juan

Argentina

E-mail address: [amestre@unsj.edu.ar](mailto:amestre@unsj.edu.ar)

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**Tatiana L. MODZALEVSKAYA (Russia)** continues working on Silurian-Devonian brachiopods of Iran from Kopet-Dag and Derenjal Mountains in collaboration with Leonid Popov (UK) and coauthor, Hairapetian, V., Ghobadi Pour. Paper: "A new, aberrant rhynchonellide with a strophic shell from the Silurian of Iran" will be published in Acta Palaeontologica Polonica. Together with Prof. Fernando Alvarez (Spain) we are continuing our investigations on athyridids from Kuznetsk Basin, Russia. Work on new material of Upper Ordovician-Silurian brachiopods from Kotel'ny Island (Arctic Russia), which were collected by colleagues from VNIIOkeangeologiya and Pamir.

**Tatiana L. Modzalevskaya**

All-Russian Geological Research Institute (VSEGEI)

Department of Stratigraphy and Palaeontology

Sredny pr. 74

St.Petersburg, 199106, Russia  
E-mail address: [TModzalevskaya@vsegei.ru](mailto:TModzalevskaya@vsegei.ru) (office);  
[modz@IB2567.spb.edu](mailto:modz@IB2567.spb.edu) (home)

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**Axel MUNNECKE (Germany)** is currently working on Ordovician and Silurian (chemo-) stratigraphy in different areas (China, Gotland, Poland, Podolia). In addition, he is very interested in the biological response to the pronounced climatic changes that took place during this time.

**Axel Munnecke**  
GeoZentrum Nordbayern, Loewenichstr. 28,  
D-91054 Erlangen, Germany  
Telephone: 0049 9131 85 26957  
Fax number: 0049 9131 85 22690  
E-mail: [axel.munnecke@fau.de](mailto:axel.munnecke@fau.de)

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**Diego Fernando MUÑOZ (Argentina)** is doing a PhD at Universidad Nacional de Córdoba on Lower Ordovician deposits of NW Argentina with emphasis on systematics, taphonomy and diversity of rhynchonelliformean brachiopods. This research is directed by Dr. Juan Luis Benedetto and Dr. Beatriz G. Waisfeld. Muñoz and Benedetto are undertaking publication of lingulid brachiopods from the Santa Rosita Formation (Furongian-Tremadocian) of NW Argentina. A revision of the *Lipanorthis* genus, which is present in Tremadocian and Floian deposits of the Santa Victoria Group, is in the final stages of preparation.

**Diego F. Muñoz**  
Centro de Investigaciones en Ciencias de la Tierra (CICTERRA): CONICET-UNC  
Centro de Investigaciones Paleobiológicas (CIPAL): FCEFyN, UNC  
Edificio CICTERRA, Av. Vélez Sársfield 1611, 1° Piso of. 7, X5016CGA  
Ciudad Universitaria, Córdoba, ARGENTINA  
Of.: +54 351 535-3800 int. 30212  
Cel.: +54 (9) 351 15-6669998  
e-mail: [dmunoz2708@gmail.com](mailto:dmunoz2708@gmail.com)

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**Elise NARDIN (France)** is working on the investigation of faunal dynamism and ecological adaptations as major factors of the Early-Middle Palaeozoic biodiversifications. The first approach is the investigation of the functional morphology of echinoderms (blastozoans and crinoids) during the Paleozoic and the ecological interactions of these echinoderms with the other benthic fauna. The second approach is the question of the impact of the paleogeography and the environmental factors on the diversity dynamics of Paleozoic fauna (collaboration B. Lefebvre (Univ.-Lyon, France), M. Aretz (Univ.-Toulouse, France) Y. Donnadiu (LSCE, France). The biodiversification constraints are also investigated by global earth modeling to reconstruct marine environment, paleoclimate variations,

paleobioproductivity and boundary conditions of anoxic events (collaboration with G. Dera and Y. Godd ris (Univ.-Toulouse, France), Y. Donnadi u (LSCE, France), E. Puc at (Univ. Dijon, France), and G. Le Hir (IGCP, France)), and their impact on the marine life.

**Elise Nardin**

Geosciences Environment Toulouse  
Observatoire Midi-Pyr n es, CNRS  
14 avenue Edouard Belin  
F-31400 Toulouse, France  
Tel. +33 561332577  
E-mail. [elise.nardin@get.obs-mip.fr](mailto:elise.nardin@get.obs-mip.fr)

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**Hendrik NOWAK (France)** continues his PhD, which is part of the RALI (Rise of Animal Life) project, researching palynomorphs from the Ordovician Lagerst tten of the Fezouata Formations (Morocco, Tremadocian-Floian) and the Winneshiek Shale (Iowa, USA, Darriwilian).

**Hendrik Nowak**

Universit  Lille 1  
UMR 8217 G osyst mes, U.F.R. des Sciences de la Terre  
B timent SN5, Avenue Paul Languevin  
59655 Villeneuve d'Ascq, France  
Telephone: +33 (0)320336023  
E-mail address: [hendrik.nowak@ed.univ-lille1.fr](mailto:hendrik.nowak@ed.univ-lille1.fr)

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**Godfrey S. NOWLAN (Canada)** retired from the Geological Survey of Canada in July 2013 and has cut back scientific activity considerably. I remain a volunteer at GSC but most of my time is related to Global Geoparks in Canada and finishing a popular book (with others) on the Geology of Canada entitled *Four Billion Years and Counting: Canada's Geological Heritage* that should come out in 2014. Research continues at a moderate level mainly with Bob Elias (University of Manitoba) and Graham Young (Manitoba Museum) on conodonts from the Williston and Hudson Bay Basins. I am also working with Bill Arnott and David Lowe (University of Ottawa) on dating Lower Paleozoic sediments in near contact with basement in the Ottawa area. I completed a short paper on *Iapetognathus* with Jim Miller and others.

**Godfrey S. Nowlan**

Geological Survey of Canada  
3303 – 33<sup>rd</sup> Street NW  
Calgary, Alberta T2L 2A7 Canada  
Phone: 403-292-7079  
Fax: 403-292-4961  
E-mail: [gnowlan@NRCan.gc.ca](mailto:gnowlan@NRCan.gc.ca)

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**Olga OBUT (Russia)** is investigating Ordovician radiolarians and conodonts from Gorny Altai (South of West Siberia).

**Dr. Olga T. Obut**

Trofimuk Institute of Petroleum Geology and Geophysics  
Siberian Branch of RAS  
Acad. Koptuyug av., 3  
630090, Novosibirsk, Russia  
Tel: +7 (383) 333-24-31  
Fax: +7 (383) 333-23-01  
E-mail address: [ObutOT@ipgg.sbras.ru](mailto:ObutOT@ipgg.sbras.ru)

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**Alan OWEN (UK)** is continuing his investigations of the Ordovician biodiversification in general and of deep water faunas in particular. Ordovician trilobites are included in a paper in press on the fine scale crystallography of schizochroal trilobite eyes with Martin Lee (Glasgow) and former research student Clare Torney. Work on new material of the trilobite *Staurocephalus* and on abnormal encrinurid specimens from the Upper Ordovician of South Wales with Patrick McDermott (St Clears, South Wales) is progressing, but slowly.

**Alan W. Owen**

School of Geographical & Earth Sciences  
University of Glasgow  
Gregory Building, Lilybank Gardens  
Glasgow G12 8QQ Scotland U.K.  
Tel: +44 (0)141-330-5461  
Fax: +44 (0)141-330-4817  
E-mail address: [Alan.Owen@glasgow.ac.uk](mailto:Alan.Owen@glasgow.ac.uk)

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**Florentin PARIS (France)** continues various collaborations on Ordovician chitinozoans assemblages from Northern Gondwana and is implementing several regional chitinozoan atlases. My updated CHINOVOSP database presently records 1266 chitinozoan species with stratigraphical ranges documented according to the latest definitions of the Ordovician, Silurian and Devonian stages.

**Florentin Paris**

4 rue des Jonquilles,  
35235 Thorigné-Fouillard, France  
(florentin.paris@orange.fr)

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**Ian PERCIVAL (Australia)** continued studies on various Ordovician projects during 2013, but also admits to dabbling in Cambrian and Silurian faunas. A paper describing Late Cambrian lingulate brachiopods from the Maruia district of New Zealand's South Island (co-authored with Yong Yi Zhen who documented associated Early Ordovician

conodonts, together with John Simes and Roger Cooper from GNS) is currently in press (*AAP Memoir Cambro-Ordovician Studies V*). Yong Yi has recently (November 2013) taken up a secondment with the Geological Survey of NSW and is now working with Ian at his Londonderry office. Two manuscripts with Wu Rongchang as senior author, on Ordovician conodont biodiversification and biofacies in China, were progressed towards publication. Other Ordovician projects are underway with Petr Kraft and Zhang Yuandong (graptolites), and Vic Semeniuk and Barry Webby (petrography and depositional environments of the Cliefden Caves Limestone Group. Finally, by the time this edition of *Ordovician News* is distributed, a manuscript on geochemistry of Ordovician cherts from southeastern Australia will have been submitted.

In June and July 2013, Ian hosted Page Quinton, a Ph.D student at the University of Missouri, during her short-term Australian Academy of Sciences – National Science Foundation fellowship. Her research involves study of Ordovician seawater temperatures, especially with respect to the Late Ordovician glaciation episodes, using conodonts for isotopic analysis. Page collected limestone samples and conodonts through the Ordovician succession in central New South Wales, and is currently analysing these back in Missouri.

Ian also edits two annual newsletters: *Ordovician News* in his capacity as Secretary of the Subcommittee on Ordovician Stratigraphy, and *Nomen Nudum* (for the Association of Australasian Palaeontologists).

#### **Ian Percival**

Geological Survey of New South Wales  
WB Clarke Geoscience Centre  
947-953 Londonderry Rd, Londonderry NSW 2753  
Tel. (02) 4777 0315  
Fax (02) 4777 4397  
e-mail: [ian.percival@industry.nsw.gov.au](mailto:ian.percival@industry.nsw.gov.au)

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**José Manuel PIÇARRA (Portugal)** is working on the Lower Paleozoic stratigraphy of South Portugal (Ossa Morena Zone), and also on the Ordovician and Silurian graptolites from Portugal.

#### **José Manuel Piçarra d'Almeida**

LNEG - LGM (Laboratório Nacional de Energia e Geologia – Laboratório de Geologia e Minas). Unidade de Geologia, Hidrogeologia e Geologia Costeira  
Ap. 104 , 7801-902 Beja Codex , Portugal  
tel.: 351 210924672 (note new phone number)  
e.mail: [jose.picarra@lneg.pt](mailto:jose.picarra@lneg.pt)

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**Leonid E. POPOV (United Kingdom)** is presently working on the brachiopods and associated faunas from the Upper Ordovician of Kazakhstan, Ordovician of Iran and Upper Ordovician of the Zerafshan Range in Uzbekistan.

#### **Leonid E. Popov**

Department of Geology, National Museum of Wales,

Cardiff CF10 3NP, United Kingdom.  
E-mail address: leonid.popov@museumwales.ac.uk; lepbarry@yahoo.co.uk

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**John REPETSKI (USA)** continues to work chiefly on Cambrian, Ordovician and Middle Devonian conodonts and biostratigraphy of various regions, mostly in Laurentia, including the Appalachians, Midcontinent North America, Great Basin, and Alaska.

Support for geologic mapping and CAI-based thermal maturation maps dominates, but I am also working on several regional biostratigraphic, faunal, and taxonomic studies; most of these are in cooperation with numerous good colleagues. Collaborative work also continues on phosphatized larval arthropods, embryos, and paleobiology of the paraconodont-euconodont transition interval.

Activity is beginning to ramp up for the planning committee related to planning for next year's ISOS-2015, under the very competent leadership of Steve Leslie. We are looking forward to seeing many of our fellow Ordoviciphiles here in Virginia next year.

**John E. Repetski**

U.S. Geological Survey,  
MS 926A National Center,  
12201 Sunrise Valley Drive,  
Reston, Virginia 20192, U.S.A.  
Telephone number: 1-703-648-5486  
Fax number: 1-703-648-6953  
E-mail address: [jrepetski@usgs.gov](mailto:jrepetski@usgs.gov) (work), or [jrepetski@cox.net](mailto:jrepetski@cox.net) (home)

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**Matthew SALTZMAN (USA)** continues working on Ordovician stable and radiogenic isotope stratigraphy. PhD student Cole Edwards has just published his first paper in *Palaeo3* on the Early-Middle Ordovician C isotopes in the Shingle Pass and Ibex areas of Utah and Nevada (USA). Cole has also generated Sr isotope data from conodont apatite and carbonate rock in North America and we have one paper submitted to *GSA Bulletin* and another in preparation documenting these results with many co-authors, including Steve Leslie, John Repetski, Stig Bergstrom, Jeff Bauer, Gary Dwyer, and Walt Sweet. Work continues on a collaborative project with Steve Westrop in the Middle-Late Ordovician. In addition, collaborative efforts with Ben Gill and Lee Kump are planned on coupled carbon-sulfur studies in the Early Ordovician, and a new project is also planned with Alycia Stigall on Middle Ordovician brachiopod evolution in North America and comparisons to Baltoscandia.

**Matthew R. Saltzman**

School of Earth Sciences  
125 South Oval Mall  
Ohio State University  
Columbus OH 43210-1398 U.S.A.  
phone: 614-292-0481  
email: saltzman.11@osu.edu

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**Vic SEMENIUK (Australia)**, with Ian Percival and Barry Webby, continues to work on the petrography, stratigraphy, palaeo-environmental reconstructions, and palaeoecology of Ordovician limestones of central western New South Wales. With Barry Webby Vic is researching the diagenesis and other alteration products of Ordovician labechiid stromatoporoids, and the inter-relations between the stromatoporoids and the enclosing sediment.

**Vic Semeniuk**

21 Glenmere Rd., Warwick,  
WA, 6024 Australia  
vcsrg@inet.net.au\

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**Nikolay SENNIKOV (Russia)**: Current activities include 1) Study and description of Ordovician graptolites from Novosibirsk Islands (Arctic Russia); 2) Paleogeographic reconstructions of the Ordovician basins on the South of west Siberia; 3) Specification and synthesis of the graptolite, conodont and chitinozoan zonation for the Ordovician of Siberia.

**Dr. Nikolay V. Sennikov**

Trofimuk Institute of Petroleum Geology and Geophysics  
Siberian Branch of RAS  
Acad. Koptuyug av., 3  
630090, Novosibirsk, Russia  
Tel: +7 (383) 330-88-47  
Fax: +7 (383) 333-23-01  
E-mail address: [SennikovNV@ipgg.sbras.ru](mailto:SennikovNV@ipgg.sbras.ru)

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**Thomas SERVAIS (France)** is research director of the CNRS at Lille1 University, where he is the head of the CNRS department (UMR 8217 Géosytèmes) for one more year in 2014. He is currently a Vice-President of the International Paleontological Association (IPA: 2010-2014) and Past-President of the International Federation of Palynological Societies (IFPS), the French Palaeontological Association (APF) and the French Palynological Association (APLF).

The "book" on palaeobiogeography (the last product of IGCP 503) has finally been published in December 2013, co-edited with Dave Harper (Durham University, UK). All Ordovician workers should now buy this Geol Soc Memoir 38!

Ordovician research is focused on acritarchs, including collaboration with Li Jun and Yan Kui (NIGPAS, Nanjing) and Wang Wenhui (Nanjing University) on the Ordovician of the Yangtze Platform. A revision of several Ordovician taxa is in progress, such as *Rhopaliophora* and *Dactylofusa velifera*.

A paper on the first appearance data of many important peri-Gondwanan taxa will maybe get ready this year in order to be submitted, in collaboration with Stewart Molyneux (British Geological Survey) and several other colleagues.

Projects on the regional geology of western Europe includes a revision of the Belgian sequences in collaboration with Alain Herbosch (University of Brussels, Belgium).

The PhD project of H. Nowak started at Lille in late 2012 focuses on the palynology of some Ordovician Lagerstätten including the Fezouata Biota of Morocco.

**Thomas Servais**

UMR 8217 Géosystèmes  
Bâtiment SN5  
Université Lille1  
F-59655 Villeneuve d'Ascq (France)  
Phone: 0033(0)320337220  
Fax: 0033(0)320434910  
[thomas.servais@univ-lille1.fr](mailto:thomas.servais@univ-lille1.fr)

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**Lawrence SHERWIN (Australia)** continues with post retirement part time employment by the Geological Survey of NSW. His main item of work for 2014 is reviewing identifications and locality details of graptolites in the Geological Survey collection, the catalogue entries going back to 1898. For the past half century most entries are his own. Other outstanding projects are part completed studies on Late Ordovician graptolite faunas from Forbes and with the late Tatiana Koren' from a locality near Orange. He presented a talk at the 3rd IGCP 591 meeting at Lund in June 2013.

**Lawrence Sherwin**

Geological Survey of New South Wales  
Locked Bag 21, Orange  
New South Wales 2800 Australia  
email: [lawrence.sherwin@trade.nsw.gov.au](mailto:lawrence.sherwin@trade.nsw.gov.au)  
Phone: 61 (0)2 6360 5349 Fax: 61 (0)2 6360 5366  
Mobile: 0458 757 515

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**Tatiana TOLMACHEVA (Russia)** continuous to work on Ordovician conodonts from Kazakhstan and Russian part of East European platform and Ural Mountains. Last autumn I received a Doctor of Science Degree for the Thesis “Ordovician conodonts of East-European platform and Western part of the Central Asian Folded Belt: biostratigraphy, biogeography and paleoecology”. The Kazakhstani part of the thesis will be published as a monograph hopefully at the end of this year. I collaborate with colleagues from the Geological institute and Moscow State University (Andrei Dronov, Alexander Alekseev, Kirill Degryarev) on several research projects concerning sequence stratigraphy, tectonic and paleodynamic reconstructions of Central Asia and Siberia in the Ordovician. My ongoing research project is on Cambrian conodont clusters from siliceous rocks of Central Kazakhstan. An updated regional stratigraphic scheme of Kazakhstan (with Kirill Degryarev and Olga Nikitina) is in preparation.

**Tatiana Tolmacheva**

Leading scientist of  
Stratigraphy and Paleontology Department  
A.P. Karpinsky Russian Geological Research Institute,  
Sredny pr. 74, 199106 Saint Petersburg, Russia

Telephone: 8 (812) 328 92 10  
E-mail: [tatiana\\_tolmacheva@vsegei.ru](mailto:tatiana_tolmacheva@vsegei.ru)

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**Blanca A. TORO (Argentina).** After my incorporation to CICTERRA-CONICET at Cordoba University I continue working on Ordovician and Silurian graptolites from the Central Andean Basin, northwestern Argentina. I am specially focused on biostratigraphy and palaeobiogeography, but in addition quantification analyses of taxonomic and paleoecological relationships of graptolites were conducted recently for the first time in Argentina. A PhD thesis under my supervision was finished last year, and a number of papers regarding these topics have just been published. Other multidisciplinary projects dealing with Ordovician and Silurian graptolites from Bolivia and Brazil, as well as international cooperation with colleagues from Germany and China are still in progress.

**Blanca A. Toro**

CICTERRA (Centro de Investigaciones en Ciencias de la Tierra)  
CONICET-Universidad Nacional de Córdoba  
Av. Vélez Sarsfield 1611, Ciudad Universitaria  
X5016GCA - Córdoba - ARGENTINA  
[btorogr@mendoza-conicet.gov.ar](mailto:btorogr@mendoza-conicet.gov.ar)

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**Thijs VANDENBROUCKE (France)** continues to be interested in reconstructing the Ordovician palaeoclimate and palaeo-environment. Two research students currently work with Thijs on these topics: Chloé Amberg's project concentrates on identifying and documenting Pre-Hirnantian glaciations (see last year's report). Lorena Tessitore joined the team as a PhD student in 2013, with a research project that is part of the ANR research grant "SeqStrat-Ice: Lessons from our Ancient Frozen Planet" (Project coordinator: J.F. Ghienne, University of Strasbourg/CNRS, 2013-2017). This ANR grant focuses on the glacial deposits of the Upper Ordovician, and Lorena contributes to the development of a bio-chemostratigraphic framework for the Moroccan successions studied within this programme.

Thijs also remains active as one of the coordinators of the IGCP 591 project. All information can be found on our website [www.igcp591.org](http://www.igcp591.org). The group is looking forward to seeing you at one of their next meetings (see circulars of the 2014 Tartu meeting and this year's regional field meeting in Kunming, elsewhere in this newsletter).

**Thijs Vandenbroucke**

Université Lille 1 - Sciences et Technologies  
UMR 8217 du CNRS: Géosystèmes  
Avenue Paul Langevin- bâtiment SN5  
59655 Villeneuve d'Ascq cedex  
France

(T) + 33 (0)3 20 43 69 00

(E) [Thijs.Vandenbroucke@univ-lille1.fr](mailto:Thijs.Vandenbroucke@univ-lille1.fr)

(W) <http://geosystemes.univ-lille1.fr/geosystemes/spip.php?rubrique94>

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**Marco VECOLI (Saudi Arabia)** is working on acritarchs, chitinozoans and cryptospores from Ordovician and Silurian deposits in Saudi Arabia in support of basin analyses and sequence stratigraphy interpretation for hydrocarbon exploration. In particular, I am responsible for a project, among others, on the stratigraphy and correlation of Upper Ordovician subsurface sequences in the NW of Saudi Arabia, targeting hydrocarbon systems which are related to the Late Ordovician glacial episode. My work requires continued hands-on analytical work which includes taxonomic revisions, as well as refining biozonal concepts to suit exploration and operational needs. I am also having a lot of fun during well-site palynological analyses supporting drilling operations across Saudi Arabia.

I am slowly completing a number of research projects started before I joined Saudi Aramco, with my former students and international colleagues, on Ordovician acritarchs and cryptospores, mainly from North Africa and North America.

This year, moreover, will be my final one of the 4-year term (2010-2014) as President of the CIMP (International Commission on Paleozoic Microflora).

**Marco Vecoli**  
Biostratigraphy Group  
Geological Technical Services Division  
Saudi Aramco  
Dhahran, Saudi Arabia

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

**Olev Vinn**  
Department of Geology, University of Tartu  
Ravila 14A  
50411 Tartu, Estonia  
Tel./Fax +372-7375836  
E-mail: [olev.vinn@ut.ee](mailto:olev.vinn@ut.ee)

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**Viive VIIRA (Estonia)** continues to work on the Lower and Middle Ordovician from Estonia.

**Viive Viira**  
Institute of Geology at Tallinn Technical University  
Ehitajate tee 5  
19086 Tallinn, Estonia  
tel. 372 58846899  
[Viive.viira@ttu.ee](mailto:Viive.viira@ttu.ee)

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**Gustavo G. VOLDMAN (Argentina)** is actively working on taxonomy, biostratigraphy, and thermal alteration studies of conodonts from the Ordovician basins of Northwestern Argentina.

**Gustavo G. Voldman**  
CONICET, CICTERRA  
Av. Vélez Sarsfield 1611  
Córdoba X5016GCA, Argentina  
Tel. +54-351-433-3199 #30208  
gvoldman@efn.uncor.edu

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**Barry WEBBY (Australia).** All the Treatise Online chapters dealing with sections of the *Treatise on Invertebrate Paleontology*, Part E, Revised volume 4 (Hypercalcified Porifera) were published prior to early 2013, and now currently (Feb 2014) the fully integrated “Blue Book” *Treatise* on all known nonspiculate fossil sponges with hypercalcified skeletons is being assembled in two volumes (exceeding 1200 printed pages of text and illustrations) for printing by the University of Kansas Press - hopefully the volumes will be available to all later this year (2014).

In addition, a joint paper on the Ordovician and Silurian biogeography of stromatoporoids with Heldur Nestor was published recently (in online version appeared in late 2013; and within the hard copy version (22 Jan 2014) of the final IGCP 503 report in the Memoir Series of the Geological Society of London on Lower Palaeozoic palaeobiogeography. My other current work remains partly curatorial, involving cataloguing and transferring an extensive Ordovician collection to the two main long-term fossil repositories in the Sydney region (the Australian Museum, and Londonderry laboratory and storage facility of the Geological Survey of New South Wales). Also preliminary work on a small collection of Ordovician sphinctozoans and other sponges collected originally by Leonid Popov and others from Kazakhstan is continuing with the help of Leonid, Ian Percival, Zhen Yong Yi and others; and work is continuing on some Mid-Palaeozoic stromatoporoid faunas from New South Wales and North Queensland, also with Zhen Yong Yi.

**Barry D. Webby**  
Department of Earth & Planetary Sciences,  
Macquarie University,  
North Ryde, NSW 2109  
AUSTRALIA  
Tel. +61-2-9816-4020  
E-mail: [bwebby25@gmail.com](mailto:bwebby25@gmail.com)  
Home address: 77 Woolwich Road, Hunters Hill, N.S.W., 2110, Australia

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**Charles WELLMAN (UK)** continues his work on early land plant spores and other remains, including those from the Ordovician. In 2013 he undertook fieldwork in Kazakhstan for the first time and sampled a number of Ordovician sections for palynological analysis. He continues with his work on Ordovician spore assemblages from Saudi Arabia (in conjunction with Philippe Steemans) and Oman. Charles is still

on the look-out for Ordovician terrestrial deposits and would love to hear from any of you with news on that front.

**Charles Wellman**

Dept. of Animal & Plant Sciences  
University of Sheffield  
Alfred Denny Building  
Western Bank  
Sheffield S10 2TN U.K.  
Tel: 0114 222 3689  
E-mail: [c.wellman@sheffield.ac.uk](mailto:c.wellman@sheffield.ac.uk)

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**Rongchang WU (China)** is working on Ordovician and Silurian conodonts and chemostratigraphy. My research mainly focuses on conodont taxonomy, palaeoecology, biostratigraphy, chemostratigraphy and carbonate sedimentology. Currently, I am collaborating with Prof. Mikael Calner in Lund, investigating Ordovician stratigraphy in Sweden.

**Rongchang Wu**

Dept. of Geology, Lund University  
Sölvegatan 12, S-223 62 Lund, Sweden.  
E-mail: [Rongchang.Wu@geol.lu.se](mailto:Rongchang.Wu@geol.lu.se)

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**YAN Kui (China)** continued work on Ordovician acritarchs this past year. In June, I attended the IGCP 591 annual meeting in Lund, Sweden, and visited the Lower Paleozoic sections in Sweden and Norway. Li Jun and I also visited Prof. Thomas Servais in France. In August, I went to North China to collect microfossil samples from the Middle-Upper Ordovician with my colleague. I also work on the acritarch biostratigraphy and palaeoenvironment in South China, especially the Ordovician acritarch assemblages and will begin to study the North China acritarch assemblage.

**Yan Kui**

Nanjing Institute of Geology and Paleontology Academia Sinica  
39 East Beijing Road, Nanjing  
China  
Tel: 86-25-83282214  
E-mail: [kuiyan@nigpas.ac.cn](mailto:kuiyan@nigpas.ac.cn)

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**Graham YOUNG (Canada)** is continuing to work on Palaeozoic palaeoecology and on the diversity of Ordovician cnidarians and arthropods. I am also collaborating with Bob Elias and others to study palaeoenvironments and stratigraphy in the Ordovician rocks of central and northern Manitoba; a recently published field trip guidebook captures the current state of knowledge. Detailed studies of the varied fossils at the William Lake site in central Manitoba are under way, in collaboration with Dave Rudkin, Michael Cuggy,

and others. Our current focus is on preparation and description of a large number of well-preserved eurypterid specimens.

**Graham Young**

The Manitoba Museum  
190 Rupert Avenue  
Winnipeg, MB, R3B 0N2  
Canada  
Phone: 1-204-988-0648  
Fax: 1-204-942-3679  
[gyoung@manitobamuseum.ca](mailto:gyoung@manitobamuseum.ca)

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**ZHAN Renbin (China)** reports that in 2013, together with my colleagues within our institute and China and in the world, I have kept working on the Great Ordovician Biodiversification Event (GOBE). More case studies conducted in South China reveal that the first acme of the Ordovician brachiopod radiation was apparently episodic: first on the upper part of the Jiangnan Slope, then on the vast area of the Yangtze Platform and finally at those near shore, shallow water localities. The discovery of some primitive strophomenids from the lower to middle Dapingian on the Yangtze Platform indicates that South China might be a cradle of the GOBE. New case studies on this particular topic and the end-Ordovician mass extinction are going on.

**Dr. Zhan Renbin**

State Key Laboratory of Palaeobiology and Stratigraphy  
Nanjing Institute of Geology and Palaeontology (NIGP)  
Chinese Academy of Sciences  
39 East Beijing Road  
Nanjing 210008, China  
Tel./fax:+86-25-83282132;mobile:+86-13851647619  
E-mail:rbzhan@nigpas.ac.cn

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**Shunxin ZHANG (Canada)** has focused her research on biostratigraphy and petroleum potential in Hudson Bay and Foxe Basin. She has worked on the Late Ordovician conodont biostratigraphy on Melville Peninsula in the Arctic area; she has also worked on the Late Ordovician and Early Silurian conodonts (taxonomy and CAI) from limestone xenoliths on Hall Peninsula, Baffin Island where there is no Phanerozoic cover nowadays. She used the conodont data to estimate the thickness of eroded Paleozoic strata and erosion rate, as well as the kimberlite temperatures.

**Shunxin Zhang**

Canada-Nunavut Geoscience Office  
PO Box 2319, 1106 Inuksugait IV, 1<sup>st</sup> floor  
Iqaluit, Nunavut X0A 0H0  
Canada

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**Yuandong ZHANG (China)** continues working on:

(1) Ordovician integrated stratigraphy. This work aims at a refined stratigraphic correlation of late Darriwilian to early Sandbian black shale in South China and Tarim, based on an integrated biostratigraphy of the graptolite, conodont, chitinozoan, acritarch and radiolarians (with Zhen Yongyi of Australia, and colleagues in NIGPAS), and chemostratigraphy on stable carbon isotope records in South China, Tarim and their implications for a refined stratigraphic correlation (with Axel Munnecke from Erlangen-Nurnberg University of Germany). This work has been supported by a grant from the Natural Science Foundation of China (Jan. 2012 to Dec. 2015).

(2) Systematics of the graptolites from the Ningkuo and Hulo Formations (Floian to Sandbian, Ordovician) in SE China, which is envisaged as a monograph with tens of plates of SEM and BSEM pictures showing the fine microstructures preserved in pyritic modes. This work has been slow due to frequent interruptions and will take a couple of more years to be ready for publication.

(3) Palaeogeographic reconstruction and facies patterns of late Ordovician to early Silurian in South China and Tarim, as the black shale of this interval has been highly rated as potential hydrocarbon source rocks. This work has been financially supported by the Ministry of Science and Technology of China (project entitled “Palaeogeographic reconstruction of some critical intervals of Paleozoic in South China and Tarim”, 2011-2015).

(4) Gas shale in China: extensions and primary geological features. This has been the main work of a launching project on gas shale in China by the Chinese Academy of Sciences (2014-2018). This work will include several drills for cores of the major gas shale intervals in China, i.e. Early Cambrian, Darriwilian-Sandbian, Late Katian to Llandovery, Late Permian and Late Triassic (non-marine facies). These cores will be stored in Nanjing Institute of Geology and Palaeontology and made available to global scientists for study and appropriate sampling. Those who have interests in being involved in this work, please contact the project leader (Zhang Yuandong).

**Yuandong ZHANG**

Nanjing Institute of Geology and Palaeontology  
39 East Beijing Road, Nanjing 210008  
China  
Tel.: 0086-25-83282145  
Fax: 0086-25-83357026, 83282140  
E-mail: [ydzhang@nigpas.ac.cn](mailto:ydzhang@nigpas.ac.cn)

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**Yong Yi ZHEN (Australia)** recently joined the Geological Survey of New South Wales (GSNSW), after having worked in palaeontology collections management and curation at the Australian Museum, Sydney for nearly 18 years. I am now heavily involved in the digitization and management of the fossil collections of GSNSW, in support of the regional geological mapping projects being carried out in New South Wales. I am also researching late Cambrian and Ordovician conodonts from New South Wales and other parts of Australia, New Zealand, and China.

**Yong Yi Zhen**

Geological Survey of New South Wales  
W.B. Clarke Geoscience Centre,



947-953 Londonderry Rd, Londonderry,  
NSW 2753. Australia  
Telephone: 61 2 47770318  
Fax: 61 2 47774397  
e-mail: yong-yi.zhen@industry.nsw.gov.au

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## ORDOVICIAN RESEARCH PUBLICATIONS

[note that while the following compilation predominantly lists papers concerned solely with Ordovician topics, for completeness and comparison it also includes some publications dealing with studies of Furongian and Llandovery biota and stratigraphy]

### A

- Albanesi, G.L. & Ortega, G., eds. 2013. *Conodonts from the Andes*. Proceedings of the 3<sup>rd</sup> International Conodont Symposium and IGCP 591 Regional Field Meeting. Publicación Especial N° 13, Asociación Paleontológica Argentina, Buenos Aires, 1-156.
- Albanesi, G.L. & Aldridge, R.J. 2013. The Ordovician conodont fauna of the Santa Gertrudis Formation, Cordillera Oriental of NW, Argentina: New taxa, age and environmental significance. In: Albanesi, G.L. & Ortega, G. eds. *Conodonts from the Andes*, Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina (Abstract). Publicación Especial N° 13, Asociación Paleontológica Argentina, 135.
- Albanesi, G.L., Bergström, S.M., Schmitz, B., Serra, F., Felters, N.A., Goldman, G.H.G. & Ortega, G., 2013. Darriwilian (Middle Ordovician)  $\delta^{13}\text{C}_{\text{carb}}$  chemostratigraphy in the Precordillera of Argentina: Documentation of the middle Darriwilian Isotope Carbon Excursion (MDICE) and its use for intercontinental correlation. *Palaeogeography, Palaeoclimatology, Palaeoecology* **389**, 48-63. doi.org/10.1016/j.palaeo.2013.02.028
- Ahlberg, P. & Bergström, S.M., 2013. Minnesteckningar över avlidna ledamöter. Jan Bergström, 1938-2012. *Kungliga Fysiografiska Sällskapet I Lund*, Årsbok 2011-2012, 113-115.
- Ahlberg, P. & Bergström, S.M., 2013. Paleozoolog, geolog och folkbildare. *Geologiskt Forum* **77**, 25-26.
- Álvaro, J.J., Ahlberg, P., Babcock, L.E., Bordonaro, O.L., Choi, D.K., Cooper, R.A., Ergaliev, G. Kh., Gapp, I.W., Ghobadi Pour, M., Hughes, N.C., Jago, J.B., Korovnikov, I., Laurie, J.R., Lieberman, B.S., Paterson, J.R., Pegel, T.V., Popov, L.E., Rushton, A.W.A., Sukhov, S., Tortello, M.F., Zhou, Z. & Żylińska, A. 2013. Global Cambrian trilobite biogeography assessed using parsimony analysis of endemism. *Geological Society, London, Special Publications* **38**, 269-292.
- Araújo, A., Piçarra, J., Borrego, J., Pedro, J. & Oliveira, T. 2013. As regiões Central e Sul da Zona de Ossa Morena. In: *Geologia de Portugal, vol. I - Geologia Pré-mesozóica de Portugal* (Dias, R., Araújo, A., Terrinha, P. & Kullberg, eds), pp. 509-549. Escolar Editora, ISBN 978-972-592-364-1.
- Armstrong, D.K., Lavoie, D., McCracken, A.D., Asselin, E. & Galloway, J.M. 2013. Stratigraphy and source rocks of the Hudson Platform in northern Ontario. *Geological Association of Canada – Mineralogical Association of Canada, Program with Abstracts v. 36*, p. 63-64.
- Armstrong, D.K., McCracken, A.D., Asselin, E. & Brunton, F.R. 34. 2013. Project Unit 10-028. The Hudson Platform Project: Stratigraphy of the core Aquitaine Sogepet et al. Pen No. 1. *Summary of Field Work and Other Activities 2013, Ontario Geological Survey, Open File Report 6290*, p. 34-1 to 34-21.

### B

- Baars, C., Ghobadi-Pour, M. & Atwood, R. 2013. The earliest rugose coral. *Geological Magazine* **150**(2), 371–380.

- Bae, B.-Y., Elias, R.J. & Lee, D.-J. 2013. Growth characteristics in co-occurring Upper Ordovician species of *Catenipora* from southern Manitoba, Canada. *Lethaia* 46(1), 98-113.
- Bassett, M.G., Ghobadi Pour, M., Popov, L.E. & Kebria-ee Zadeh, M.R. 2013. First report of craniide brachiopods in the Palaeozoic of Iran (*Pseudocrania*, Ordovician); and Early–Mid Ordovician biogeography of the Craniida. *Palaeontology* 56, 209-216.
- Benedetto, J.L. 2012. *Gatosella*, a new basal plectambonitoid brachiopod with undercut cardinal process from Mid Ordovician limestones of the Precordillera terrane, Argentina. *Journal of Systematic Palaeontology* 10, 435-443.
- Benedetto, J.L., Halpern, K. & Galeano Inchausti, J.C. 2013. High-latitude Hirnantian (latest Ordovician) brachiopods from the Eusebio Ayala Formation of Paraguay, Paraná Basin. *Palaeontology* 56, 61-78.
- Benedetto, J.L. 2013. Presence of punctae in the ‘plectorthoidean’ brachiopod *Famatinorthis turneri* (Middle Ordovician) from western Argentina: implications for early diversification of punctate orthides. *Lethaia* 42, 170-179.
- Benedetto, J.L. 2013. Upper Ordovician brachiopods from the San Benito Formation, Cordillera del Tunari, Bolivia. *Ameghiniana* 50, 418-428.
- Beresi, M.S. 2013. Discovery of Silurian sponge spicules of the Argentine Precordillera. *Geological Journal*: 48, 248-255. DOI: 10.1002/gj.1334
- Beresi, M.S. & Rigby, J.K. 2013. Middle Cambrian protospongiid sponges and cancelloriids from the Precordillera of Mendoza Province, western Argentina. *Neues Jahrbuch für Geologie und Paläontologie* 268(3), 259-274.
- Bergström, S.M., Eriksson, M.E., Young, S.A. & Widmark, E.-M., 2013. Conodont biostratigraphy, and  $\delta^{13}\text{C}$  and  $\delta^{34}\text{S}$  isotope chemostratigraphy, of the uppermost Ordovician and Lower Silurian at Osmundsberget, Dalarna, Sweden. *GFF* doi.org/10.1080/11035897.2012.758169
- Bergström, S.M., Eriksson, M.E., Young, S.A., Ahlberg, P. & Schmitz, B., 2013. Hirnantian (latest Ordovician)  $\delta^{13}\text{C}$  chemostratigraphy in southern Sweden and globally: a refined integration with the graptolite and conodont zone successions. *GFF*. 32 pp. dx.doi.org/10.1080/11035897.2013.8511734
- Bergström, S.M. & Ahlberg, P. 2013. Jan Bergström 1938-2012. The Paleontological Association Newsletter 82, 60-62.
- Bergström, S.M. & Ferretti, A., 2013. Late Ordovician conodonts from Great Britain. Perugia, Giornate di Paleontologia XIII edizione – Perugia, 23-25 Maggio 2013 – Volume dei Riassunti (a cura di A. Baldanza e P. Monaco): 17.
- Botting, J.P. & Zhang, Y.D. 2013. A new leptomitid-like sponge from the Early Ordovician of China with heteractinid spicules. *Bulletin of Geosciences* 88(1), 207–217.
- Boukhamsin, H., Vecoli, M., Breuer, P. & Ertug, K., 2013. High-resolution integrated palynological and graptolite biozonation in the early Silurian of the Arabian Plate. Abstracts and Program, AASP-TPS 46<sup>th</sup> Annual Meeting, San Francisco, California, USA, October 20-24, 2013, p. 51.
- Boyle, J.T., Sheets, H.D., Wu, S.-Y., Goldman, D., Melchin, M.J., Cooper, R.A., Sadler, P.M. & Mitchell, C.E. 2013. A re-examination of the contributions of biofacies and geographic range to extinction risk in Ordovician graptolites. *GFF* doi.org/10.1080/11035897.2013.861864.
- Boucot, A.J., Chen Xu, Scotese, C.R. with contribution by Morley, R.J. 2013. Phanerozoic Paleoclimate: An Atlas of Lithologic Indicators of Climate. *Society for Sedimentary Geology (SEPM) Atlas Series No. 3*, 1-478, with 28 maps.

## C

- Candela, Y., Cherns, L. & Troalen, L. In press. First record of a polyplacophoran from the Southern Uplands of Scotland. *Scottish Journal of Geology*.
- Candela, Y. & Crighton, W.R.B. In press. Revision of *Plumulites ruskini* Lamont, and new data from the Silurian of the Pentland Hills, Scotland. *Scottish Journal of Geology*.
- Candela, Y. & Harper, D.A.T. In press. Synoptic revision of the Ordovician brachiopods of the Barr and Lower Ardmillan groups of the Girvan area, Scotland. *Earth and Environmental Science Transactions of the Royal Society of Edinburgh*.
- Carlorosi, J. & Heredia, S. 2013. The Ordovician conodont *Trapezognathus* Lindström, 1955 in the Andean Basin, Argentina. *Neues Jahrbuch für Geologie und Paläontologie* 267(3), 309-321.
- Carlorosi, J., Heredia, S. & Aceñolaza, G.F. 2013 Middle Ordovician (early Dapingian) conodonts in the Andean Basin of Argentina. *Alcheringa* 37, 1-13.
- Carlorosi, J. & Heredia, S. 2013. The conodont *Trapezognathus diprion* (Lindstrom) in the Acoite Formation, Eastern Cordillera, Northwestern Argentina. In: Albanesi, G.L. & Ortega, G. eds. *Conodonts from the Andes*, Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina. Publicación Especial N° 13, Asociación Paleontológica Argentina, 1-4.
- Carrera, M.G., Fenoglio F. & Albanesi, G.L. 2013. Conodonts, sequence stratigraphy and the drowning of the San Juan carbonate platform in the Ordovician of the Argentine Precordillera. In: Albanesi, G.L. & Ortega, G. eds. *Conodonts from the Andes*, Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina. Publicación Especial N° 13, Asociación Paleontológica Argentina, 5-12.
- Carrera, M.G. & Maletz, J. (in press). Ordovician sponge spicules from Spitsbergen, Nevada and Newfoundland: new evidence for hexactinellid and demosponge early diversification. *Journal of Systematic Paleontology*.
- Chen Xu, Bergstrom, S.M., Zhang Yuandong & Wang Zhihao 2013. A regional tectonic event of Katian (Late Ordovician) age across three major blocks of China. *Chinese Science Bulletin*, 2013, **58**(34), 4292-4299.
- Chen Xu, Rong Jiayu, Fan Junxuan, Zhan Renbin, Wang Xiaofeng, Chen Qing, Mitchell, C.E., Harper, D.A.T., Melchin, M.J., Peng Ping'an & Finney, S.C. 2013. Global standard stratotype-section and point of the Hirnantian Stage of the Ordovician System. 183-213. In Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences (ed.), *Global Standard Stratotype-sections and Points in China*. Hangzhou, Zhejiang University Press. 325 pp (in Chinese).
- Chen Xu, Zhang Yuandong, Wang Zhihao, Mitchell, C.E., Bergström, S.M., Winston, D., Paris, F. & Fang Xiang 2013. Establishment of the GSSP for the base of Darriwilian (Middle Ordovician) in China. 154-181. In Nanjing Institute of Geology and Palaeontology (ed.), *Global Standard Stratotype-sections and Points in China*. Hangzhou, Zhejiang University Press. 325 pp (in Chinese).
- Cherns, L., Wheeley, J.R., Popov, L.E., Ghobadi Pour, M., Owens, R.M. & Hemsley, A.R. 2013. Long-period orbital climate forcing in the early Palaeozoic? *Journal of the Geological Society, London* 170, 707-710.
- Clauer, N., Fallick, A.E., Eberl, D.D., Honty, M., Huff, W.D. & Aubert, A. 2013. K-Ar dating and  $\delta^{18}\text{O}$ - $\delta\text{D}$  characterization of nanometric illite from Ordovician K-bentonites of the Appalachians: Illitization and the Acadian-Alleghenian tectonic activity. *American Mineralogist* 98, 2144-2154.

- Cocks, L.R.M. 2013. Generic identities and relationships within the brachiopod family Sowerbyellidae. *Palaeontology* **56**, 167-181.
- Cocks, L.R.M. & Torsvik, T.H. 2013. The dynamic evolution of the Palaeozoic geography of eastern Asia, *Earth-Science Reviews* **117**, 40-79.
- Cohen K.M., Finney S., Gibbard P.L. & Fan J. 2013. The ICS International Chronostratigraphic Chart. *Episodes* **36**(3), 199-204.
- Colmenar, J., Harper, D.A.T. and Villas, E. 2014. Morphofunctional analysis of *Svobodaina* species (Brachiopoda, Heterorthidae) from south-western Europe. *Palaeontology* **57**, 193-214.
- Cooper, R.A., Sadler, P.M., Munnecke, A. & Crampton, J.S. 2013. Graptoloid evolutionary rates track Ordovician–Silurian global climate change. *Geological Magazine* **151**. doi:10.1017/S0016756813000198
- Cope J.C.W. & Kriz J. 2013. The Lower Palaeozoic palaeobiogeography of bivalves. In Harper, D.A.T & Servais, T. (eds). Early Palaeozoic biogeography and palaeogeography. *Geological Society of London, Memoir* **38**, 221-241.
- Couto, H. 2013. The Ordovician of Valongo Anticline (Northern Portugal): State of art. 13th International Multidisciplinary Scientific Geoconference and EXPO, SGEM 2013; Albena; Bulgaria; 16 June 2013 through 22 June 2013; Code 101477. Vol.1, 203-208.
- Couto, H. & Knight, J. 2013. The Montalto Formation: a pre- to basal Ordovician succession in the Dúrico-Beirã area (northern Portugal). Paleozoic Stratigraphy and Palaeogeography 1st International Congress on Stratigraphy – STRATI 2013. Abstract proceedings, p.73
- Couto, H., Knight, J., & Lourenço, A. 2013. Late Ordovician ice-marginal processes and sea-level change from the north Gondwana platform: Evidence from the Valongo Anticline (northern Portugal). *Palaeogeography, Palaeoclimatology, Palaeoecology* **375**, 1-15.
- Cramer, B.D., Schmitz, M.D., Huff, W.D., Bergström, S.M. & Kolata, D.R., 2013. Rapid geochemical change in Silurian oceans: implications for global  $^{13}\text{C}$  and  $^{87}\text{Sr}/^{86}\text{Sr}$  systematics. Third Annual Meeting of IGCP Project 591, Lund, Sweden, Proceedings, 73.
- Cramer, B.D., Schmitz, M.D., Huff, W.D., Bergström, S.M. & Kolata, D.R. 2013. So what is the deep time Earth History revolution? Geological Society of America, Abstracts with Programs 45(7), 746.

## D

- Danelian, T., Noble, P., Pouille, L. & Maletz, J. 2013. Palaeogeographic distribution of Ordovician radiolarian occurrences: patterns, significance and limitations. In Harper, D.A.T. & Servais, T. (eds). *Early Palaeozoic Palaeobiogeography and Palaeogeography*. *Geological Society London, Memoir* **38**, 407-413. Doi:10.1144/M38.25
- Dattilo, B.F., Brett, C.E., Schramm, T.J., 2012. Tempestites in a teapot? Condensation-generated shell beds in the Upper Ordovician, Cincinnati Arch, USA. *Palaeogeography, Palaeoclimatology, Palaeoecology* **367-368**, 44-62.
- Davies, J.R, Waters, R.A, Molyneux, S.G., Williams, M., Zalasiewicz, J.A., Vandenbroucke, T.R.A. & Verniers, J. 2013. A revised sedimentary and biostratigraphical architecture for the Type Llandovery area, Central Wales. *Geological Magazine* **150**, 300 - 332.

- de la Puente, G.S. & Rubinstein, C.V. 2013. Ordovician chitinozoans and marine phytoplankton of the Central Andean Basin, northwestern Argentina: A biostratigraphic and paleobiogeographic approach. *Review of Palaeobotany and Palynology* **198**, 14-26 (<http://dx.doi.org/10.1016/j.revpalbo.2012.03.007>).
- de la Puente, G.S. & Rubinstein, C.V. 2013 (in press). New palynological data from the Upper Ordovician of the Precordillera Basin, Argentina: A potential key for understanding the geological history of the Precordillera terrain. *Stratigraphy - IGCP 591 issue* **10**(4).
- de la Puente, G.S., Rubinstein, C.V. & Astini, R.A., 2013. Silurian chitinozoans and organic-walled phytoplankton from northwestern Argentina, Western Gondwana. 46th Annual Meeting of AASP – The Palynological Society, Dino 10, CAP - The Canadian Association of Palynologist, CIMP – Commission Internationale de la Microflore du Paléozoïque Subcommissions and NAMS – The North American Micropaleontology Section of SEPM, San Francisco. Abstracts 72-73.
- Dronov, A. 2013. Late Ordovician cooling event: Evidence from the Siberian Craton. *Palaeogeography, Palaeoclimatology, Palaeoecology* **389**, 87-95.
- Dronov A.V. 2013. Depositional sequences and sea-level changes in the Ordovician of Baltoscandia. In: Gladenkov, Yu.B., Mezhelovsky, N.V. (Eds.) *Stratigraphy in the early XXI century – tendencies and new ideas*. Geokart, GEOS, (ISBN 978-5-89118-611-8) Moscow, pp. 65-92 (in Russian).
- Dronov A.V. 2013. New International Geologic Time Scale for the Ordovician System and its relations to the Regional Scales for the Ordovician of Russia. In: Fedonkin M.A. (Ed.) *General Stratigraphic Scale of Russia: current state and ways of perfection*. GIN RAS, (ISBN 978-5-98709-394-8), Moscow, pp. 125-126 (in Russian).

## E

- Ebbestad, J.O.R., Frýda, J., Wagner, P., Horný, R.J., Isakar, M., Stewart, S., Percival, I.G., Bertero, V., Rohr, D.M., Peel, J.S., Blodgett, R.B. & Högström, A.E.S. 2013. Biogeography of Ordovician and Silurian gastropods, monoplacophorans, and mimospirids. In Harper D.A.T. & Servais T. (eds) *Early Palaeozoic Biogeography and Palaeogeography. Geological Society of London, Memoir* **38**, 199-220.
- Edwards, C.T., Saltzman, M.R., Leslie, S.A., Bauer, J.A. & Bergström, S.M. 2013. Strontium isotope ( $\text{Sr}^{87}/\text{Sr}^{86}$ ) stratigraphy of Ordovician conodont apatite and carbonate bulk rock: implications for preservation of primary seawater chemistry. *Geological Society of America, Abstracts with Programs*, 45(7), 528.
- Egenhoff, S. & Maletz, J. 2013. The sediments of the Floian GSSP – depositional history of the Ordovician succession at Mount Hunneberg, Västergötland, Sweden. *GFF* **134**, 237-249. <http://dx.doi.org/10.1080/11035897.2012.749943>
- Elias, R.J., Young, G.A., Lee, D.-J. & Bae, B.-Y. 2013. Coral biogeography in the Late Ordovician (Cincinnatian) of Laurentia. In D.A.T. Harper & T. Servais (eds.), *Early Palaeozoic Biogeography and Palaeogeography. Geological Society (London) Memoir* **38**, 97-115.
- Elias, R.J., Young, G.A., Stewart, L.A., Demski, M.W., Porter, M.J., Lukie, T.D., Nowlan, G.S. & Dobrzanski, E.P. 2013. Ordovician-Silurian boundary interval in the Williston Basin outcrop belt of Manitoba: a record of global and regional environmental and biotic change. Geological Association of Canada-Mineralogical Association of Canada Joint Annual Meeting, Field Trip Guidebook FT-C5; Manitoba Innovation, Energy and Mines, *Manitoba Geological Survey Open File*

OF2013-1, 49 p. <[http://www.manitoba.ca/iem/mrd/info/libmin/gacmac/OF2013-1\\_FT-C5.pdf](http://www.manitoba.ca/iem/mrd/info/libmin/gacmac/OF2013-1_FT-C5.pdf)>

- Ellwood, B.B., Brett, C.E., Tomkin, J.H. & MacDonald, W.D. 2013. Visual identification and quantification of Milankovitch climate cycles in outcrop: an example from the Upper Ordovician Kope Formation, northern Kentucky. *In* Herrero-Bervera, E., Jovane, L., eds. *Magnetostratigraphy: Not only a dating tool. The Geological Society of London Special Publication*, London.
- Eriksson, M.E., Hints, O., Paxton, H. & Tonarova, P. 2013. Ordovician and Silurian polychaete diversity and biogeography. *Geological Society Memoirs* 38, 265-272.
- Ernst, A. & Carrera, M.G. 2012. Upper Ordovician (Sandbian) bryozoan fauna from Argentinean Precordillera. *Journal of Paleontology* 86(5), 721-752
- Ernst, A., Kraft, P. & Zágorský, K. 2014, in press. Trepostome bryozoans from the Zahořany Formation (Upper Ordovician) of Loděnice, Prague Basin, Czech Republic. *Paläontologische Zeitschrift*. DOI 10.1007/s12542-013-0183-3
- Evans, D.H., Ghobadi Pour, M. & Popov, L.E. 2013. Review of the Early to Mid Ordovician orthoconic cephalopods from Iran. *Bulletin of Geosciences* 88(1), 21-44.

## F

- Fan, J., Chen, Q., Hou, X., Miller, A.I., Melchin, M.J. Shen, S., Wu, S., Goldman, D., Mitchell, C.E., Yang, Q., Zhang, Y., Zhan, R., Wang, J., Leng, Q., Zhang, H. & Zhang, L. 2013. Geobiodiversity Database: a comprehensive section-based integration of stratigraphic and paleontological data. *Newsletters on Stratigraphy* 46, 111-136.
- Fan, J., Chen, Q., Melchin, M.J., Sheets, H.D., Chen, Z., Zhang, L. & Hou, X. 2013. Quantitative stratigraphy of the Wufeng and Lungmachi black shales and graptolite evolution during and after the Late Ordovician mass extinction. *Palaeogeography, Palaeoclimatology, Palaeoecology* 389, 96-114.
- Färber, C. & Munnecke, A. 2014. Gypsum evaporites in a patch reef of the upper Slite Group in the Silurian (Wenlock) of Gotland, Sweden. *GFF* 136, in press.
- Feltes, N. & Albanesi, G.L. 2013. *Periodon* and *Paroistodus* biofacies of the Las Aguaditas Formation Lower Member (Midde Ordovician), Central Precordillera of San Juan, Argentina. *In*: Albanesi, G.L. & Ortega, G. eds. *Conodonts from the Andes*, Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina. Paleontological Note Publicación Especial N° 13, Asociación Paleontológica Argentina, 17-24.
- Feltes, N., Albanesi, G.L. & Bergström, S.M. 2013. Middle Darriwilian conodont zones in the uppermost San Juan Limestone and the Lower Member of the Las Aquaditas Formation, central Precordillera of Argentina. *In*: Albanesi, G.L. & Ortega, G. eds. *Conodonts from the Andes*, Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina. Paleontological Note Publicación Especial N° 13, Asociación Paleontológica Argentina, 25-31.
- Ferretti, A., Bergström, S.M. & Barnes, C.R., 2013. Composition and significance of the Katian (Upper Ordovician) conodont fauna of the Sholeshook Limestone in South Wales, UK. *In*: Albanesi, G.L. & Ortega, G. eds. *Conodonts from the Andes*, Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina. Paleontological Note Publicación Especial N° 13, Asociación Paleontológica Argentina, 138.

- Ferretti, A., Bergström, S.M. & Barnes, C.R., 2013. Katian (Upper Ordovician) conodonts from Wales. *Palaeontology*, published online: 20 December 2013. DOI: 10.1111/pala.12089
- Ferretti, A., Cardini, A., Crampton, J., Serpagli, E., Sheets, H.D. & Štorch, P., 2013. Rings without a lord? Enigmatic fossils from the lower Palaeozoic of Bohemia and the Carnic Alps. *Lethaia*, 46: 211-221. DOI: 10.1111/let.12004.
- Finney, S.C. 2013. The Reality of GSSPs. *Ciências da Terra (UNL)*, Lisboa **18**, 9-12.
- Finney, S.C. 2014. Dedicating America's GSSPs - International Geostandards. *GSA Today* **24**(2), 20-21.
- Fortey, R.A. & Bruton, D.L. 2013. Lower Ordovician trilobites of the Kirtonryggen Formation, Spitsbergen. *Fossils & Strata* **59**, 1-118.
- Frisch, K., Munnecke, A., Schulbert, C. & Zhang, Y.D. 2013. Tubes or cell sheet? A 3-D reconstruction of *Halysis* Høeg, 1932, from the Upper Ordovician of South China. *Facies* **59**, 113-132.

## G

- Gendry, D., Courville, P., Saucède T., Laffont R. & Paris, F. 2013. Contribution of morphometrics to the systematics of the Ordovician genus *Neseuretus* (Calymenidae, Trilobita) from the Armorican Massif, France. *Journal of Paleontology* **87**, 456-471.
- Giuliano, M.E., Albanesi, G.L., Ortega, G. Zeballo, F.J. & Monaldi C.R. 2013. Conodonts and graptolites of the Santa Rosita Formation (Tremadocian) from the Nazareno area, Santa Victoria Range, Cordillera Oriental of Salta, Argentina. In: Albanesi, G.L. & Ortega, G. eds. *Conodonts from the Andes*, Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina. Paleontological Note Publicación Especial N° 13, Asociación Paleontológica Argentina, 39-44.
- Giuliano, M.E., Ortega, G., Albanesi, G.L. & Monaldi, C.R. 2013. Late Cambrian - Early Tremadocian conodont and graptolite records from the El Médano section, Salar del Rincón, Puna of Salta, Argentina. In: Albanesi, G.L. & Ortega, G. eds. *Conodonts from the Andes*, Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina. Paleontological Note Publicación Especial N° 13, Asociación Paleontológica Argentina, 33-38.
- Goddéris, Y., Donnadieu, Y., Le Hir, G., Lefebvre, V. & Nardin, E. 2014. The role of palaeogeography in the Phanerozoic history of atmospheric CO<sub>2</sub> and climate. *Earth-Science Reviews* **128**, 122-138.
- Goldman, D., Bergström, S.M., Sheets, H.D. & Pantle, C.A. 2013. A CONOP9 composite taxon range chart for Ordovician conodonts from Baltoscandia: a framework for biostratigraphic correlation and maximum likelihood biodiversity analyses. *GFF*, doi.org/10.1080/11035897.2013.809549
- Goldman, D., Maletz, J., Melchin, M.J. & Fan, J. 2013. Lower Palaeozoic graptolite biogeography. In Harper, D.A.T. & Servais, T. (eds). *Early Palaeozoic Palaeobiogeography and Palaeogeography*. Geological Society, London, *Memoir* **38**, 415-428. doi: 10.1144/M38.26
- Goldman, D., Sheets, H., Bergström, S.M., Nolvak, J., Mitchell, C.E. & Vandenbroucke, T.R.A. 2013. High-resolution stratigraphic correlation and biodiversity dynamics of Middle and Late Ordovician marine fossils from Baltoscandia and Poland. Geological Society of America, Abstracts with Programs, 43(7), 236.
- Graham, L.E., Cook, M.E., Wilcox, L.W., Graham, J., Taylor, W., Wellman, C.H. & Lewis, L. 2013. Resistance of filamentous Chlorophycean, Ulvophycean, and



Xanthophycean algae to acetolysis: testing Proterozoic and Paleozoic microfossil attributions. *International Journal of Plant Sciences* **174**, 947-957.

Graham, L., Lewis, L.A., Taylor, W., Wellman, C. & Cook, M. 2013. Early terrestrialization: transition from algal to bryophyte grade. 9-28 *In*: Hanson, D.T. & Rice, S.K. (eds) *Photosynthesis in bryophytes and early land plants, Advances in Photosynthesis and Respiration* **37**. Springer Science.

## H

Harper, D.A.T., Rasmussen, C.M.Ø., Liljeroth, M., Blodgett, R.B., Candela, Y., Jin, J., Percival, I.G., Rong, J., Villas, E. & Zhan, R. 2013. Biodiversity, biogeography and phylogeography of Ordovician rhynchonelliform brachiopods. *In* Harper, D.A.T. & Servais, T. (eds) *Early Palaeozoic Biogeography and palaeogeography*. Geological Society, London, Memoirs, **38**, 127-144.

Harper, D.A.T. and Servais, T. (eds) 2013. Early Palaeozoic Biogeography and Palaeogeography. *Geological Society, London, Memoir* **38**, 490 pp.

Harper, D.A.T. & Servais, T. 2013. Early Palaeozoic biogeography and palaeogeography: towards a modern synthesis. *Geological Society, London, Memoir* **38**, 1-3.

Halpern, K., Rustán, J.J. & Meroi Arcerito, F.R. (in press). The first Hirnantian (latest Ordovician) odontopleurid trilobite from Western Gondwana (Argentina). *Revista Brasileira de Paleontologia*.

Heredia, S., Carlorosi, J., Mestre, A & Soria, T. 2013. Stratigraphical distribution of the Ordovician conodont *Erraticodon* Dzik in Argentina. *South American Journal of Earth Sciences* **45**, 224-234.

Heredia, S. & Mestre, A. 2013. Advances in the middle Darriwilian conodont biostratigraphy of the Argentina Precordillera. *In*: Albanesi, G.L. & Ortega, G. eds. *Conodonts from the Andes*, Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina. Publicación Especial N° 13, Asociación Paleontológica Argentina, 45-48.

Heredia, S. & Mestre, A. 2013. El conodonte darriwiliano *Lenodus variabilis* en la Precordillera Central de San Juan, Argentina. *Serie Correlación Geológica* **29**(1), 81-92.

Hints, L. 2014 (in press). Revision of the concept of the orthide brachiopod *Cyrtonotella* in the Middle Ordovician of the East Baltic. *Estonian Journal of Earth Sciences* **63**.

Hints, L. & Harper, D.A.T. (in press). The Hirnantian (Late Ordovician) brachiopod fauna of the East Baltic: Taxonomy of the key species. *Acta Palaeontologica Polonica*. doi.org/10.4202/app.2013.0010

Hints, L., Popov, L.E. & Holmer, L.E. 2013. Morphology, ontogeny and affinities of the Hirnantian triplisiid brachiopod *Streptis undifera* from Baltoscandia. *Palaeontology* **56**, 961–970.

Hints, O., Martma, T., Männik, P., Nõlvak, J., Põldvere, A., Shen, Y. & Viira, V. 2014. New data on Ordovician stable isotope record and conodont biostratigraphy from the Viki reference drill core, Saaremaa Island, western Estonia. *GFF*. DOI:10.1080/11035897.2013.873989

Holmden, C., LaPorte, D.L., Patterson, W.P., Mitchell, C.E., Melchin, M.J. & Finney, S.C. 2013. Nd isotope records of Late Ordovician sea-level change – implications for glaciation frequency and global stratigraphic correlation. *Palaeogeography, Palaeoclimatology, Palaeoecology* **386**, 131-144.

Huang Bing, Harper, D.A.T. & Hammer, Ø. 2013. Introduction to PAST, a comprehensive statistics software package for paleontological data analysis. *Acta Palaeontologica Sinica* **52**, 161-181.

## J

Jarochovska, E., Tonarová, P., Munnecke, A., Ferrová, L., Sklenář, J. & Vodrážková, S. 2013. An acid-free method of microfossil extraction from clay-rich lithologies using the surfactant Rewoquat. *Palaeontologia Electronica* **16**(3), Article Number 7T, 16pp.

## K

Knaust, D. & Dronov, A. 2013. *Balanoglossites* Ichnofabrics from the Middle Ordovician Volkhov Formation (St. Petersburg Region, Russia). *Stratigraphy and Geological Correlation* **21**(3), 265-279.

## L

Lamsdell, J.C., Percival, I.G. & Poschmann, M. 2013. The problematic ‘chelicerate’ *Melbournopterus crossotus* Caster & Kjellesvig-Waering: a case of mistaken identity. *Alcheringa* **37**, 344-348.

Lefebvre, B., Sumrall, C.D., Shroat-Lewis, R.A., Reich, M., Webster, G.D., Hunter, A.W., Nardin, E., Rozhnov, S.V., Guensburg, T.E., Touzeau, A., Noailles, F. & Sprinkle, J. 2013. Chapter 14 - Palaeobiogeography of Ordovician echinoderms. *In*: Harper, D.A.T. & Servais, T. (eds) 2013. Early Palaeozoic Biogeography and Palaeogeography. *Geological Society, London, Memoir* **38**, 173-198.

Le Hérisse, A., Paris, F. & Steemans, P. 2013. Late Ordovician-earliest Silurian Ppalynomorphs from Chad and correlation with contemporaneous deposits of southeastern Libya. *Bulletin of Geosciences* **88**, 483-504.

Lehnert, O., Meinhold, G., Bergström, S.M., Calner, M., Ebbestad, J., Egenhoff, S., Frisk, Å., Hannah, J.L., Högström, A., Huff, W.D., Juhlin, C., Maletz, J., Stein, H.J., Sturkell, E. & Vandenbroucke, T.A., 2012. New Ordovician-Silurian drill cores from the Siljan impact structure in Central Sweden – an integral part of the Swedish Deep Drilling Program. *GFF* **134**, 87-98.

Liang, K., Lee, D.-J., Elias, R.J., Pärnaste, H. & Mõtus, M.-A. 2013. Growth characteristics of *Protoheliolites norvegicus* (Tabulata; Upper Ordovician; Estonia). *Palaeontology* **56**(4), 867-891.

Li Jun, Servais, T. & Yan Kui, 2013. Review of the Ordovician acritarch genus *Rhopaliophora*. *In* Lindskog, A. & Mehlqvist, K. (eds.), Proceedings of the 3rd IGCP 591 Annual Meeting Lund, Sweden, 9–19 June 2013, 181-182.

## M

Maletz, J. & Slovacsek, M. 2013. Lower Ordovician (Dapingian) *Baltograptus* species (Graptolithina) in Dalarna, Sweden. *Palaeontology* **56**(5), 1107-1120. doi: 10.1111/pala.12038.

Maletz, J. & Kozłowska, A. 2013. Ordovician graptolites from the Yichang area, Hubei, China. *Paläontologische Zeitschrift* **87**(4), 445-454. doi: 10.1007/s12542-013-0174-4.

Maletz, J., Steiner, M., Weber, B. & Zhu, M. 2014. The Cambrian Bioradiation Event: A Chinese Perspective. *Palaeogeography, Palaeoclimatology, Palaeoecology*.

- doi: 10.1016/j.palaeo.2013.12.017
- Maletz, J. & Kozłowska, A. 2013. Dendroid graptolites from the Lower Ordovician (Tremadocian) of the Yichang area, Hubei, China. *Palaontologische Zeitschrift* **87**, 445-454.
- Maletz, J. 2013. Fossil Hemichordata (Pterobranchia, Enteropneusta). *Palaeogeography, Palaeoclimatology, Palaeoecology*. doi: 10.1016/j.palaeo.2013.06.010
- McCracken, A.D., Armstrong, D.K., Lavoie, D., and Brunton, F.R. 2013. Conodonts from the Hudson Bay and Moose River basins of Ontario. *Canadian Paleontology Conference Proceedings* No. 11, p. 43 (poster abstract).
- Meidla, T., Tinn, O., Salas, M.J., Williams, M., Siveter, D.J., Vandenbroucke, T.R.A. & Sabbe, K. 2013. Biogeographical patterns of Ordovician ostracods. In: Harper, D.A.T. & Servais, T. (eds) 2013. Early Palaeozoic Biogeography and Palaeogeography. *Geological Society, London, Memoir* **38**, 337-354. <http://dx.doi.org/10.1144/M38.21>
- Melchin, M.J., Mitchell, C.E., Holmden, C. & Štorch, P. 2013. Environmental changes in the Late Ordovician-early Silurian: Review and new insights from black shales and nitrogen isotopes. *Geological Society of America Bulletin* **125**, 1635-1670.
- Merrell, M., Breuer, P., Ertug, K. & Vecoli, M. 2013. Late Cambrian acritarchs from the subsurface Arabian Gulf, Saudi Arabia. Abstracts and Program, AASP-TPS 46<sup>th</sup> Annual Meeting, San Francisco, California, USA, October 20-24, 2013, p. 138.
- Mestre, A. 2013. Middle Darriwilian conodont biostratigraphy of the Villicum Range, Eastern Precordillera, Argentina. In: Albanesi, G.L. & Ortega, G. eds. *Conodonts from the Andes*, Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina. Publicación Especial N° 13, Asociación Paleontológica Argentina, 69-72.
- Mestre, A., Beresi, M. & Heredia, S. 2013. Nautiloid cephalopod concentration beds in the San Juan Formation (middle Darriwilian) of the Argentine Precordillera. In: Albanesi, G.L. & Ortega, G. eds. *Conodonts from the Andes*, Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina. Publicación Especial N° 13, Asociación Paleontológica Argentina, 73-78.
- Mestre, A., Beresi, M., Heredia, S. & Nestell, G. 2013. Microfossils of the *Yangtzeplacognathus crassus* Zone in the middle Darriwilian of the Argentine Precordillera. In: Albanesi, G.L. & Ortega, G. eds. *Conodonts from the Andes*, Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina. Publicación Especial N° 13, Asociación Paleontológica Argentina, 79-84.
- Mestre, A. & Heredia, S. 2013. La Zona de *Yangtzeplacognathus crassus* (Conodonts), Darriwiliano de la Precordillera Central de San Juan, Argentina. *Ameghiniana* **50**(4), 407-417.
- Mestre, A. & Heredia, S. 2013. Biostratigraphic significance of Darriwilian conodonts from Sierra de La Trampa Central Precordillera, San Juan, Argentina. *Geosciences Journal* **17**(1), 43-53.
- Miller, J.F., Evans, K.R., Kurtz, V.E. & Repetski, J.E. 2013. Biostratigraphy and sequence stratigraphy of Cambrian and lowest Ordovician strata in Missouri, in Mulvany, P.S. & Thompson, T.L. (editors), Paleozoic succession in Missouri, Part 1, Cambrian System. Missouri Department of Natural Resources, *Missouri Geological Survey Report of Investigations* **70**, Pt. 1, Chapter 2, 13-24.
- Miller, J.F., Repetski, J.E., Nicoll, R.S., Nowlan, G.S. & Ethington, R.L. 2013. The conodont *Iapetognathus* and its value for defining the base of the Ordovician. *GFF* **151**, 1-4. doi: <http://dx.doi.org/10.1080/11035897.2013.862851>
- Mitchell, C.E., Melchin, M.J., Cameron, C.B. & Maletz, J. 2013. Phylogenetic analysis reveals that *Rhabdopleura* is an extant graptolite. *Lethaia* **46**, 34-56. DOI: 10.1111/j.1502-3931.2012.00319.x.

- Molyneux, S.G., Delabroye, A., Wicander, R. & Servais, T. 2013. Biogeography of Palaeozoic phytoplankton. *Geological Society, London, Memoir* **38**, 365-397.
- Muir, L.A., Botting, J.P., Carrera, M. & Beresi, M.S. 2013. Palaeobiogeography of Silurian Porifera. *In*: Harper, D.A.T. & Servais, T. (eds), Early Palaeozoic Palaeobiogeography and Palaeogeography. *Geological Society of London, Memoir* **38**, 81-95.
- Muir, L.A., Zhang, Y.-D. & Lin, J.-P. 2013. *Inocaulis* is a graptolite: shown by new material from the Ordovician of Guizhou, China. *Alcheringa* **37**(4): 565-566.
- Murdock, D.J.E., Dong, Xi-Ping, Repetski, J.E., Marone, Federica, Stampanoni, Marco, & Donoghue, P.C.J. 2013. The origin of conodonts and of vertebrate mineralized skeletons. *Nature* **502**, 546-549 +4 p. Extended Data doi:10.1038/nature12645

## N

- Nardin, E., Vandenbroucke, T.R.A., Cramer, B.D. & Aretz, M. 2013. Palaeozoic stratigraphy: past, recent advances and future challenges. *Ciências da Terra* **18**, 57-60.
- Nestor, Heldur, & Webby, Barry, D. 2013 Biogeography of the Ordovician-Silurian Stromatoporoidea (Chapter 7). *In* Harper D.A.T. & Servais, T. (eds). Early Palaeozoic Biogeography and Palaeogeography. *Geological Society of London, Memoir* **38**, 67-79.

## O

- Ortega, G., Albanesi, G.L. & Zeballo, F.J. 2013. Machaeridians and related faunas from the Middle and Upper Ordovician of the Argentine Precordillera. *Geological Journal* **48**, 212-221. DOI: 10.1002/gj.2460.

## P

- Percival, I.G., Quinn, C. & Zhen, Y.Y. 2012. Depositional history and distribution of Ordovician rocks on the Australian Plate. Proceedings of the 34<sup>th</sup> International Geological Congress 2012. 5-10 August, 2012, Brisbane, Australia, p. 2144.
- Percival, I.G., Zhen, Y.Y., Simes, J.E. & Cooper, R.A. 2014. Furongian (late Cambrian) brachiopods and associated conodonts from the Takaka Terrane in the Springs Junction – Maruia area, South Island, New Zealand. *Memoirs of the Association of Australasian Palaeontologists* **45**, 55-70.
- Pope, M.C. & Leslie, S.A. 2013. New data from Late Ordovician-Early Silurian Mount Kindle Formation measured sections, Franklin Mountains and eastern Mackenzie Mountains, Northwest Territories. *Geological Survey of Canada, Current Research* 2013-8, 14 pgs.
- Popov, L.E. & Cocks, L.R.M. 2013. The radiation of early Silurian spiriferide brachiopods, with new taxa from the Llandovery of Iran. *Alcheringa* **37**, 558-564.
- Popov, L.E., Holmer, L.E., Bassett, M.G., Ghobadi Pour, M. & Percival, I.G. 2013. Biogeography of Ordovician linguliform and craniiform brachiopods. *In* Harper D.A.T. & Servais T. (eds) Early Palaeozoic Biogeography and Palaeogeography. *Geological Society of London, Memoir* **38**, 117-126.
- Popov, L.E., Kebria-ee Zadeh, M.-R., Ghobadi Pour, M., Holmer, L.E. & Modzalevskaya, T.L. 2013. Cambrian (Furongian) rhynchonelliform brachiopods from the Eastern Alborz Mountains, Iran. *Bulletin of Geosciences* **88**(3), 525-538.

- Pouille, L., Danelian, T., Ghobadi Pour, M. & Popov, L.E. 2013. New and Revised Inaniguttid radiolaria and associated trilobites from the Upper Darriwilian (Ordovician) Shundy Formation of Kazakhstan. *Journal of Paleontology* **87**(6), 1143-1159.
- Pouille, L., Danelian, T. & Maletz, J. 2013. Radiolarian diversity changes during the Late Cambrian–Early Ordovician transition as recorded in the Cow Head Group of Newfoundland (Canada). *Marine Micropaleontology*. doi.org/10.1016/j.marmicro.2013.05.002
- Pouille, L., Delabroye, A., Vandenbroucke, T.R.A., Calner, M., Lehnert, O., Vecoli, M. & Danelian, T. 2013. Chitinozoan biostratigraphy across the Katian (Late Ordovician) GICE event in the Borensult-1 drillcore (Sweden). *Review of Palaeobotany and Palynology* **198**, 134-144.

## R

- Robson, S.D. & Young, G.A. 2013. Late Ordovician conulariids from Manitoba, Canada. *Journal of Paleontology* **87**(5), 775-785.
- Rong Jiayu, Huang Bing, Zhan Ren-bin & Harper, D.A.T. 2013. Latest Ordovician and earliest Silurian brachiopods succeeding the *Hirnantia* fauna in south-east China. *Special Papers in Palaeontology* **90**, 142 pp.
- Rudkin, D.M., Cuggy, M.B., Young, G.A. & Thompson, D.P. 2013. An Ordovician pycnogonid (sea spider) with serially subdivided “head” region. *Journal of Paleontology* **87**(3), 395-405.

## S

- Sayar, C. & Cocks, L.R.M. 2013. A new Late Ordovician *Hirnantia* Fauna from NW Turkey, its biostratigraphical relationships and palaeogeographical setting. *Geological Magazine* **150**, 479-496.
- Sell, B, Ainsaar, L., and Leslie S.A., 2013 Precise timing of the Late Ordovician (Sandbian) super-eruptions and associated environmental, biological, and climatological events. *Journal of the Geological Society, London*, **170**(5):711-714.
- Sennikov, N.V., Obut, O.T., Lykova, E.V., Khabibulina, R.A. 2013. New data on paleogeographic and biogeographic zoning for the Ordovician and Silurian of the west part of Altai-Sayan Folded Area. In: Systematics of organisms. Its implication for biostratigraphy and paleobiogeography. Contributions of the LIX session of Paleontological society of RAS (April, 1-5, 2013, St.-Petersburg). St-Petersburg, p. 107-108. [in Russian]
- Sennikov N.V., Obut O.T., Lykova E.V., Khabibulina R.A. Traces of global and regional sedimentary and biotic events in the middle-late Ordovician and early Silurian Gorny Altai and Salair sections (Siberia) // Proceedings of the 3<sup>rd</sup> IGCP 591 Annual Meeting - Lund, Sweden, 9-19 June 2013. A. Lindskog & K. Mehlqvist (eds.). Lund University, 2013. p. 287-289.
- Sennikov, N.V., Tolmacheva, T.Yu., Obut, O.T. 2013. New Ordovician standard stages of the ISC and problems of its application for the Russian territory. In: General stratigraphic scale of Russia: state of art and problems of arrangement. All-Russian meeting May, 23-25, 2013. Geological Institute of RAS, Moscow / Fedonkin M.A. et al (Eds). Moscow: GI RAS. P. 101-112. [in Russian]
- Serra, F. & Albanesi, G.L. 2013. Paleoecology and paleobiogeography of Darriwilian conodonts from the Las Chacritas Formation, Central Precordillera of San Juan, Argentina. In: Albanesi, G.L. & Ortega, G. eds. *Conodonts from the Andes*,

- Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina. Publicación Especial N° 13, Asociación Paleontológica Argentina, 103-108.
- Serra, F., Albanesi, G.L. & Bergström, S.M. 2013. Middle Darriwilian conodont biostratigraphy of the Las Chacritas Formation, Central Precordillera of San Juan, Argentina. *In: Albanesi, G.L. & Ortega, G. eds. Conodonts from the Andes, Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina. Publicación Especial N° 13, Asociación Paleontológica Argentina, 109-115.*
- Serra, F., Feltes, N. & Albanesi, G.L. 2013. La Zona de *Pygodus anserinus* (Conodonta) en la Formación Las Aguaditas, Ordovícico Medio-Superior, de la Precordillera Central de San Juan, Argentina. *Reunión Anual de Comunicaciones de la Asociación Paleontológica Argentina, Córdoba, 20-22 noviembre 2013. Abstract.*
- Servais, T., Achab, A. & Asselin, E. 2013. Eighty years of chitinozoan research: from Alfred Eisenack to Florentin Paris. *Review of Palaeobotany and Palynology* **197**, 205-217.
- Servais, T., Cecca, F., Harper, D.A.T., Isozaki, Y. & Mac Niocaill, C. 2013. Palaeozoic palaeogeographical and palaeobiogeographical nomenclature. *In: Early Palaeozoic Palaeobiogeography and Palaeogeography* (Harper, D.A.T. & Servais, T., eds.). *Geological Society, London, Memoir* **38**, 25-33.
- Servais, T., Danelian, T., Harper, D.A.T. & Munnecke, A. 2014. Possible oceanic circulation patterns, surface water currents, and upwelling zones in the Early Palaeozoic. *GFF* **136**, in press.
- Servais, T., Li Jun, Molyneux, S.G., Rubinstein, C.V. & Yan Kui. 2013. The palaeogeographical spreading of the acritarch genus *Veryhachium* during the Ordovician. 292-293 *In* Lindskog, A. & Mehlqvist, K. (eds.), Proceedings of the 3rd IGCP 591 Annual Meeting Lund, Sweden, 9–19 June 2013.
- Sherwin, L. 2013. What happened in north-east Gondwana during the IGCP 591 interval? 294-296 *In* Lindskog, A. & Mehlqvist, K. (eds.), Proceedings of the 3rd IGCP 591 Annual Meeting Lund, Sweden, 9–19 June 2013.
- Song Yanyan, Zhang Yuandong & Zhang Ju. 2013. New advance in the Late Darriwilian to early Sandbian graptolite biostratigraphy of western Zhejiang and northeastern Jiangxi Provinces, SE China. *Journal of Stratigraphy* **37**(2), 144-154. (in Chinese with English abstract).
- Soria, T., Rodríguez, M.C., Mestre, A. & Heredia, S. 2013. Conodontes floianos de la Formación San Juan en la quebrada de Talacasto, Precordillera de San Juan. *Serie Correlación Geológica* **29**(1), 101-114.
- Strauss, J.V., Macdonald, F.A., Taylor, J.F., Repetski, J.E. & McClelland, W.C. 2013 (online), Laurentian origin for the North Slope of Alaska: Implications for the tectonic evolution of the Arctic: Lithosphere, 6 p., + GSA Data Repository Item 2013251. doi: 10.1130/L284.1
- Strother, P.K., Wilson, T. & Vecoli, M. 2013. Evolutionary significance of cryptospores from the Darriwilian Hanadir Shale of Saudi Arabia. Abstracts and Program, AASP-TPS 46<sup>th</sup> Annual Meeting, San Francisco, California, USA, October 20-24, 2013, p. 183.

## T

- Tanner, P.W.G., Armstrong H.A. & Owen, A.W. 2013. Rare earth element and Ls-Th-Sc analysis of cherts from the Highland Border Complex, Scotland: Geochemical determination of the sedimentary environment in greenschist facies rocks. *Scottish Journal of Geology* **49**, 15-31.

- Thusu, B., Rasul, S., Paris, F., Meinhold, G., Howard, J.P., Abutarruma, Y. & Whitham, A.G. 2013. Latest Ordovician–earliest Silurian acritarchs and chitinozoans from subsurface samples in Jebel Asba, Kufra Basin, SE Libya. *Review of Palaeobotany and Palynology* **197**, 90-118.
- Tolmacheva, T.Yu., Alekseev, A.S. & Reimers A.N. 2013. Conodonts in xenoliths from kimberlite pipes of the southeastern White Sea Region (Arkhangel'sk Oblast): key to Ordovician stratigraphic and paleogeographic reconstructions of the East European Platform. *Doklady Earth Sciences* **451**(1), 687-691.
- Tolmacheva, T.Yu., Zaitsev, A.V. & Alekseev, A.S. 2013. Middle and Upper Ordovician conodonts of the Moscow Syncline: new data on stratigraphy of the borehole Gavrilov Yam-1 Section. *Stratigraphy and Geological Correlation* **21**(4), 383-407.
- Topper, T.P., Harper, D.A.T. & Brock, G.A. 2014. Ancestral billingsellides and the evolution and phylogenetic relationships of early rhynchonelliform brachiopods. *Journal of Systematic Palaeontology* **11**, 821-833.
- Toro, B.A. & Vento, B.A. 2013. Reevaluación de las biozonas de *Tetragraptus phyllograptoides* y *T. akzharensis* (Ordovícico Inferior, Floiano) de la Cordillera Oriental Argentina. *Ameghiniana* **50**(3), 287-297.
- Torsvik, T.H. & Cocks, L.R.M. 2013. Gondwana from top to base in space and time. *Gondwana Research* **24**, 999-1030.
- Torsvik, T.H. & Cocks, L.R.M. 2013. New global palaeogeographical reconstructions for the Early Palaeozoic and their generation. In: *Early Palaeozoic Palaeobiogeography and Palaeogeography* (Harper, D.A.T. & Servais, T., eds.). *Geological Society, London, Memoir* **38**, 5-24.

## V

- Vandenbroucke, T.R.A., Munnecke, A., Leng, M.J., Bickert, T., Hints, O., Gelsthorpe, D., Maier, G. & Servais, T. 2013. Reconstructing the environmental conditions around the Silurian Ireviken Event using the carbon isotope composition of bulk and palynomorph organic matter. *Geochemistry, Geophysics, Geosystems* **14**(1), 86-101.
- Vandenbroucke, T. R. A., Armstrong, H., Williams, M., Paris, F., Sabbe, K. & Zalasiewicz, J. A. 2013. Late Ordovician zooplankton maps and the climate of the Early Palaeozoic Icehouse. In: *Early Palaeozoic Palaeobiogeography and Palaeogeography* (Harper, D.A.T. & Servais, T., eds.). *Geological Society, London, Memoir* **38**, 391-397.
- Vandenbroucke, T.R.A., Hennissen, J. & Servais, T. 2013. *Cyathochitina cycnea* (Chitinozoa), a new name for *Cyatochitina giraffa* Hennissen et al. 2010. *Journal of Micropaleontology* **32**, 107-108.
- Vandenbroucke, T., Vecoli, M., Servais, T. (eds.). Special Issue: Palaeozoic applied marine palynology. *Review of Palaeobotany and Palynology* **198**, 161 pp.
- Vandenbroucke T. R. A., Vecoli, M. & Servais, T. 2013. Palaeozoic applied marine palynology – Editorial. *Review of Palaeobotany and Palynology* **198**, 1.
- Van Iten, H., Muir, L.A., Botting, J.P., Zhang Yuan-dong & Jih-pai Lin. 2013. Conulariids and *Sphenothallus* (Cnidaria, Medusozoa) from the Tonggao Formation (Lower Ordovician, China). *Bulletin of Geosciences* **88**(4), 713-722.
- Vento, B.A. & Toro, B.A. 2014. Análisis morfométrico de especies del género *Baltograptus* (Graptolithina), en el Ordovícico temprano de la Cordillera Oriental, Argentina. *Ameghiniana* **51**(1), 52-60.

- Vento, B., Toro, B.A. & Maletz, J. 2013. Paleocological and paleobiogeographical considerations of Ordovician graptolites from the Cordillera Oriental, Jujuy Province, Argentina. *Historical Biology*. doi.org/10.1080/08912963.2013.845881
- Vernikovskiy, V.A., Metelkina, D.V., Tolmacheva, T.Yu., Malyshev, N.A., Petrov, O.V., Sobolev, N.N. & Matushkina, N.Yu. 2013. Concerning the Issue of Paleotectonic Reconstructions in the Arctic and of the Tectonic Unity of the New Siberian Islands Terrane: New Paleomagnetic and Paleontological Data. *Doklady Earth Sciences* **451**(2), 791-797.
- Vinn, O. 2013. Cornulitid tubeworms from the Ordovician of eastern Baltic. Carnets de Géologie CG2013\_L03
- Voldman, G.G., Albanesi, G.L., Monaldi, C.R. & Zeballo, F.J. 2013. Conodonts from the Santa Rosita Formation (*Paltodus deltifer* Zone, Early Ordovician) in the Santa Victoria area, Cordillera Oriental, NW Argentina. In: Albanesi, G.L. & Ortega, G. eds. *Conodonts from the Andes*, Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina. Publicación Especial N° 13, Asociación Paleontológica Argentina, 152.
- Voldman, G.G., Albanesi, G.L., Monaldi, C.R. & Zeballo, F.J., in press. An Early Ordovician conodont fauna from the Santa Rosita Formation at its type area in the Santa Victoria Range, Cordillera Oriental, Northwestern Argentina. *Stratigraphy*.
- Voldman, G.G., Albanesi, G.L., Zeballo, F.J. & Monaldi, C.R.. 2013. Early Ordovician (late Floian) conodonts from the Zenta range, Cordillera Oriental, NW Argentina. In: Albanesi, G.L. & Ortega, G. eds. *Conodonts from the Andes*, Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina. Publicación Especial N° 13, Asociación Paleontológica Argentina, 123-128.
- Voldman, G.G., Genge, M.J., Albanesi, G.L., Barnes, C.R. & Ortega, G. 2013. Cosmic spherules from the Ordovician of Argentina. *Geological Journal* **48**, 222-235. DOI: 10.1002/gj.2418.
- Voldman, G.G., Ortega, G. & Albanesi, G.L. 2013. Middle Ordovician conodonts and graptolites from new outcrops of the Gualcamayo Formation, Central Precordillera of San Juan, Argentina. In: Albanesi, G.L. & Ortega, G. eds. *Conodonts from the Andes*, Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina. Publicación Especial N° 13, Asociación Paleontológica Argentina, 117-122.

## W

- Wang Guangxu, Guo Zhengfu, Zhan Renbin & Jin Jisuo. 2013. A new technique for making serial sections of solitary rugose corals. *Palaeoworld* **22**, 68-71.
- Wang Guangxu, Zhan Renbin, Deng Zhanqiu & Liu Jianbo. 2013. Paleocological associations of middle Llandovery (Silurian) corals from Huaying Mountain, eastern Sichuan Province. *Science China Earth Sciences* **56**(4), 640-646.
- Wang, W., Feng, H., Vandenbroucke, T.R.A., Li, L. & Verniers, J. 2013. Chitinozoans from the Tremadocian graptolite shales of the Jiangnan Slope in South China. *Review of Palaeobotany and Palynology* **198**, 45-61.
- Wang, W., Vecoli, M., Vandenbroucke, T.R.A., Feng, H., Li, L. & Verniers, J., 2013. Late Tremadocian-early Floian acritarchs from graptolitic shales of the Yinzhubu and Ningkuo formations of Yiyang, South China. *Review of Palaeobotany and Palynology* **193**, 1-14.
- Wang Yi, Rong Jiayu, Zhan Renbin, Huang Bing, Wu Rongchang & Wang Guangxu. 2013. On the Ordovician-Silurian boundary strata in southwestern Hubei, and the



- Yichang Uplift. *Journal of Stratigraphy* **37**(3), 264-274 (in Chinese with English abstract).
- Wang Zhihao, Bergström, S.M., Zhen Yongyi, Chen Xu & Zhang Yuandong. 2013. On the integration of Ordovician conodont and graptolite biostratigraphy: new examples from Gansu and Inner Mongolia in China. *Alcheringa* **37**, 510-528.
- Wang Zhihao, Bergström, S.M., Zhen Yongyi & Zhang Yuandong. 2013. New discovery of conodonts from the Upper Ordovician Pingliang Formation of Pingliang, Gansu, China and its significance. *Acta Micropalaeontologica Sinica* **37**(2), 123-131. (in Chinese with English abstract)
- Wang Zhihao, Bergström, S.M., Zhen Yongyi, Zhang Yuandong & Wu Rongchang. 2013. Ordovician conodonts from Dashimen in Wuhai of Inner Mongolia, and the discovery of *Histiodela* fauna, and its significance. *Acta Micropalaeontologica Sinica* **37**(4). (in Chinese with English abstract)
- Wang, Z., Wu, R. & Bergström, S.M., 2013. Ordovician conodonts from the Lunnnan area of northwestern Taklimakan desert, Xinjiang, China, with remarks on the evolution of *Pygodus*. *Acta Paleontologica Sinica* **52**, 408-423.
- Weary, D.J., Orndorff, R.C. & Repetski, J.E. 2013. Geologic map of the Jam Up Cave and Pine Crest Quadrangles, Shannon, Texas and Howell Counties, Missouri: U.S. Geological Survey Scientific Investigations Map 3248, 1 sheet, scale 1:24,000. <http://pubs.usgs.gov/sim/3248/>.
- Wellman, C., Steemans, P., Vecoli, M., 2013. Chapter 29. Palaeophytogeography of Ordovician-Silurian land plants. In: Harper, D., Servais, T. (eds.), *Early Palaeozoic Biogeography and Palaeogeography. Geological Society of London, Memoir* **38**, 453-468.
- Williams, I.S., Trotter, J.A., Rigo, M. & Barnes, C.R. 2013. Analysing conodont d<sup>18</sup>O by SIMS. *Goldschmidt Geochemistry Conference*, Florence, Italy, 25-30 August 2013, Program with Abstracts.
- Williams, L.B., Środoń, J., Huff, W.D., Clauer, N. & Hervig, R.L. 2013. Light element distributions (N, B, Li) in Baltic Basin bentonites record organic sources. *Geochimica et Cosmochimica Acta* **120**, 582-599.
- Wu, R.C., Percival, I.G., Stouge, S. & Zhan, R.B. 2014. Conodont diversification during the Ordovician: A perspective from North China and Tarim (Northwestern China). *Science China: Earth Sciences*. doi: 10.1007/s11430-013-4777-0

## X

- Xu, C., Bergström, S.M., Zhang, Y. & Wang, Z.A. 2013. A regional tectonic event of Katian (Late Ordovician) age across three major blocks of China. *Chinese Scientific Bulletin, Geology* **58**, 4292-4299.

## Y

- Yan Kui & Li Jun. 2013. Palaeoenvironmental implications of Early–Middle Ordovician acritarch assemblages in South China. In Lindskog, A. & Mehlqvist, K. (eds.), *Proceedings of the 3rd IGCP 591 Annual Meeting Lund, Sweden, 9–19 June 2013*, 339-340.
- Yan, K., Li, J. & Servais, T. 2013. An Early-Middle Ordovician acritarch and prasinophyte assemblage from Houping, Chongqing city, South China: biostratigraphical and palaeoenvironmental implications. *Review of Palaeobotany and Palynology* **198**, 110-133.

Yan Kui, Li Jun & Wicander, R. 2013. Correlation of the Middle-Upper Ordovician boundary acritarch assemblages between the South China and Tarim Palaeocontinents. 46th Annual AASP-TPS Meeting, San Francisco, California, USA, Oct 20-24, 2013, 119.

## Z

- Zamora, S., Lefebvre, B., Álvaro, J.J., Clausen, S., Elicki, O., Fatka, O., Jell, P., Kouchinski, A., Lin, J.P., Nardin, E., Parsley, R., Rozhnov, S., Sprinkle, J., Sumrall, C.D., Vizcaïno, D. & Smith, A.B. 2013. Global Cambrian echinoderm diversity and palaeobiogeography. *Geological Society, London, Special Publications* **38**, 151-164.
- Zebalfo F.J. & Albanesi, G.L. 2013. New conodont species and biostratigraphy of the Santa Rosita Formation (late Furongian – Tremadocian) in the Tilcara range, Cordillera Orienta of Jujuy, Argentina. *Geological Journal* **48**, 170-193. DOI: 10.1002/gj.2425.
- Zebalfo F.J. & Albanesi, G.L. 2013. Conodont biofacies and palaeoenvironments of Cambrian-Ordovician sequences from the Quebrada de Humahuaca, Cordillera Oriental of Jujuy, Argentina. *Geological Journal* **48** 194-2011. DOI: 10.1002/gj.2435.
- Zebalfo, F.J., Albanesi, G.L., Voldman, G.G. & Monaldi, C.R. 2013. New records of Tremadocian conodonts (Lower Ordovician) from the Zenta Range, Jujuy Province, Argentina. In: Albanesi, G.L. & Ortega, G. eds. *Conodonts from the Andes*, Proceedings of the 3<sup>rd</sup> International Conodont Symposium, Mendoza, Argentina. Publicación Especial N° 13, Asociación Paleontológica Argentina, 129-133.
- Zhan Renbin, Jin Jisuo & Liu Jianbo. 2013. Investigation on the great Ordovician biodiversification (GOBE): Review and prospect. *Chinese Science Bulletin* **58**(33), 3357-3371 (in Chinese with English abstract).
- Zhan Renbin & Rong Jiayu. 2013. The Upper Ordovician section at Zhuzhai of Yushan County, northeastern Jiangxi: A window to investigate the geologic history of Cathasian land and the Late Ordovician platform-slope-basin pattern of South China. 137-144. In: Chen Xu & Yuan Xunlai (eds), *Field Guide for Graduate Students in Palaeontology and Stratigraphy*. Hefei: China University of Science and Technology Press. 358 pp (in Chinese).
- Zhan Renbin & Rong Jiayu. 2013. Ordovician—Silurian benthic communities and some case studies. 238-250. In: Chen Xu & Yuan Xunlai (eds), *Field Guide for Graduate Students in Palaeontology and Stratigraphy*. Hefei: China University of Science and Technology Press. 358 pp (in Chinese).
- Zhan Renbin, Jin Jisuo, Rong Jiayu and Liang Yan. 2013. The earliest known strophomenoids (Brachiopoda) from early Middle Ordovician rocks of South China. *Palaeontology*, 56(5), 1121–1148.
- Zhan Renbin, Huang Bing, Liang Yan and Jin Jisuo. 2013. Pulses of the Early Ordovician brachiopod radiation in South China. 350–353. In: Lindskog, A. and Mehlqvist, K. eds. *Proceedings of the 3<sup>rd</sup> IGCP 591 Annual Meeting — Lund, Sweden*. Lund, Lund University. 368 pp.
- Zhan Renbin, Harper, D.A.T., Jin Jisuo, Liang Yan, Liu Jianbo, Stemmerik, L. and Stouge, S. 2014. Middle Ordovician *Aporthophyla* brachiopod fauna from the roof of the world, southern Tibet. *Palaeontology* **57**, 141-170.
- Zhang Ju, Zhang Yuandong, Song Yanyan. 2013. Graptolite fauna and age of the Hungshihyen Formation (Ordovician) in eastern Yunnan, southwest China. *Journal of Stratigraphy* **37**(1): 8-17. (in Chinese with English abstract)

- Zhang, S. 2013. Ordovician conodont biostratigraphy and redefinition of the age of lithostratigraphic units on northeastern Melville Peninsula, Nunavut. *Canadian Journal of Earth Sciences* 50, 808-825.
- Zhang, S. & Pell, J. 2013. Study of sedimentary rock xenoliths from kimberlites on Hall Peninsula, Baffin Island, Nunavut. *Summary of Activities 2012*, Canada-Nunavut Geoscience Office, 107-112.
- Zhang Yuandong. 2013. An introduction to the first GSSP in China—base of the Darriwilian (Ordovician) at Changshan. In Chen Xu & Yuan Xunlai (eds), *Guide for field practice of graduate students on stratigraphy and palaeontology in South China*. Hefei: University of Science and Technology of China Press. 119-126. (in Chinese)
- Zhang Yuandong, Cao Changqun & Yu Guohua. 2013. An introduction to the Palaeozoic sections in the JCY (Jiangshan-Changshan-Yushan) area. In Chen Xu & Yuan Xunlai (eds), *Guide for the field practice of graduate students on stratigraphy and palaeontology in South China*. Hefei: University of Science and Technology of China Press. 84-119. (in Chinese)
- Zhang, Y.D., Fan, J.X., Wang, Y., Song, Y.Y. & Cheng, J.F. 2013. A mid Telychian (Llandovery) graptolite fauna from Mojiang, Yunnan Province, southwestern China. *Association of Australian Palaeontologists Memoir* 44, 123-142.
- Zhang, Y.D., Zhen, Y.Y., Munnecke, A. & Chen, X. 2012. Towards a fine correlation of the Ordovician in China – a review of latest biostratigraphic and chemostratigraphic studies. *Proceedings of the 34<sup>th</sup> International Geological Congress 2012*. 5-10 August, 2012, Brisbane, Australia, p. 2147
- Zhen, Y.Y. & Percival, I.G., 2012. Ordovician conodont studies – towards a fine-scaled regional biostratigraphic correlation in Australia. *Proceedings of the 34<sup>th</sup> International Geological Congress 2012*. 5-10 August, 2012, Brisbane, Australia, p. 2145.
- Zhen, Y.Y., Zhang, Y.D., Wang, Z.H., Bergström, S.M., Percival, I.G. & Cheng, J.F. 2012. Middle/Upper Ordovician boundary level conodont biostratigraphy and biofacies in the Dawangou section of the Tarim Basin, China. *Proceedings of the 34<sup>th</sup> International Geological Congress 2012*. 5-10 August, 2012, Brisbane, Australia, p. 2575.
- Žigaite, Ž. & Blicek, A. 2013. Chapter 28 : Palaeobiogeography of Early Palaeozoic vertebrates. In: Harper, D.A.T. and Servais, T. (eds), *Early Palaeozoic Biogeography and Palaeogeography*. *Geological Society of London Memoir* 38, 449-460.