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WANG Yi (China)
Živilė ŽIGAITĖ (Lithuania)

Silurian Subcommission website: http://silurian.stratigraphy.org
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Cover photo
Group photo of the preconference field excursion to eastern Spain of the 8th International Brachiopod Congress (Milano Italy, September 2018) led by Prof. Fernando Garcia Joral (Complutense University of Madrid), Prof. Enrique Villas (University of Zaragoza), and Prof. José Francisco Baeza-Carratalá (University of Alicante). Delegates were in the courtyard of a traditional house in Eastern Iberian Chain before they went to visit the Ordovician and Silurian rocks and fossils in that area (guided by Enrique).

Silurian Times 26 for 2018 distributed March 2019
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Dear Silurian Colleagues,

There was no major activity of the ISSS in 2018 but an important business meeting will be held soon in Milano at 3rd International Congress on Stratigraphy (STRATI 2019) in July 2–5. ISSS voting and corresponding members are sincerely encouraged to participate on this business meeting and thematic scientific session entitled „A Silurian odyssey towards advanced stratigraphy and correlation“ and devoted to all aspects of Silurian stratigraphy, including a focus on our recent efforts to establish new GSSPs for some of the Silurian Stages and Series.

Until the ISSS business meeting in Milano, our three respective working groups for base Aeronian, base Telychian and base Sheinwoodian GSSPs should submit more official proposals for potential GSSPs. Unfortunately, it is not going to happen with respect to the present state of art. I have to point out that, according to Ogg et al. (2016), „A majority of international stage boundaries (GSSPs) should be established by 2020 when a major comprehensive update of the Geologic Time Scale should be published in collaboration with Elsevier Publishing. Time has been passing quickly and our Subcommission did not follow its own plans. We planned to vote on proposed new Aeronian and Telychian GSSPs in 2019. Along with current work on the Aeronian, Telychian and Sheinwoodian GSSPs, any advances in the work on other problematic boundaries (Sheinwoodian/Homerian and Homerian/Gorstian) would also be welcomed.

A working group for the base of the Aeronian Stage has been the most active one. First formal proposal – the Hlásná Třebaň Section in the Barrandian area of the Czech Republic was published in Lethaia (Štorch et al., 2018) being followed by a comprehensive study on high-resolution stratigraphy, palaeobiogeography, proposed anagenetic changes and speciation events in the lower Aeronian monograptids of the genus Demirastrites (Štorch and Melchin, 2018). FAD of Demirastrites triangulatus is the most appropriate marker indicating base of the Aeronian Stage. Further field work conducted by Fan Junxuan et al. continued on Yuxian section in Sichuan province of China. Work on formal proposal is in progress. Preliminary report on classic Rheidol Gorge section in Wales, U.K. was presented by Melchin et al. (2016) and results of the study of chitinozoan faunas and biostratigraphy were presented by De Weirdt et al. (2017). Formal proposal of the Rheidol Gorge as an Aeronian GSSP candidate section is still under preparation.

The working group for base Telychian GSSP is working with two candidate sections: Bajiaomiao section in Hubei province of China and El Pintado Reservoir section in Seville province of Spain. Work on the former section is in progress, the latter one was described by Loydell et al. (2015) with major focus on Aeronian/Telychian boundary and lower Telychian part of the succession. Aeronian part of the section will be presented to the ISSS in the frame of Silurian thematic session at STRATI 2019. No formal GSSP proposal has
been submitted till now.

The least advanced is the work on new base Sheinwoodian GSSP. The only section studied in detail, the Banwy River section in Wales described by Loydell and Cave (1996), would be bad option due to submarine slide in the upper Telychian, intermittent fossil record, extreme rarity of proposed marker graptolite (Cyrt. murchisoni) and poor access to the section which is frequently under water. Two other Welsh sections with the potential to be a replacement GSSP: the Trannon River section and a track section in the Dyfnant Forest will need a considerable amount of work before we know their potential. Some research on a possible candidate section in Shaanxi, China, continued as well.

Therefore, the forthcoming ISSS business meeting will have to discuss somewhat insufficient activity of the subcommission. I have rarely obtained any feedback from our corresponding members. Many times my message returned as undeliverable. After all, I deleted most of the defunct addresses. Please, check the e-mail address list at the end of the annual report (p. 10) and add, correct or replace your email address if needed. I would greatly appreciate this help which will also indicate your willingness to participate on present and future activities of the subcommission. We also need to improve and update our web page. Dr. Huang Bing who was kind enough to make ad-hoc updates of the web page does not have access code any more.

I would like to encourage members of the Silurian executive and ISSS corresponding members for their suggestions regarding other topics to be on the agenda of the ISSS business meeting in Milano.

Could we find volunteers willing to organize next Silurian Symposium in a new region with Silurian outcrops less well known to present active ISSS members?

Please, send me your suggestions and proposals in this matter until May 31. Be sure that your official proposals for next ISSS meeting(s) would be much appreciated.

Last but not least, I wish to thank vice-chair Carlo Corradini and secretary Zhan Renbin for their collaboration. Also Renbin’s hard work on Silurian Times is much appreciated.

References:

Petr Štorch
Chair, International Subcommission on Silurian Stratigraphy

*******************************************************************************
International Commission on Stratigraphy

Subcommission on Silurian Stratigraphy

ANNUAL REPORT 2018

1. TITLE OF CONSTITUENT BODY and NAME OF REPORTER

Subcommission on Silurian Stratigraphy (ISSS)

Submitted by:

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2. OVERALL OBJECTIVES AND FIT WITHIN IUGS SCIENCE POLICY

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

Goals
- Rationalization of Global chronostratigraphical classification
- Intercalibration of fossil biostratigraphies, integrated zonations, and recognition of global datums.
• Establishment of magneto- and chemo-stratigraphic scales
• Redefinition of stage boundaries and restudy of global boundary stratotype sections
• Correlation of Silurian rock successions and events, including marine and non-marine
• Application of astronomically tuned cyclostratigraphy integrated with radiometric data and biostratigraphy

3. ORGANISATION-interface with other international projects / groups

Organisation

The ISSS is a Subcommission of the International Commission on Stratigraphy. The Subcommission is organized by an Executive consisting of Chairman, Vice-Chairman and Secretary, who are all Voting Members of the Subcommission. In the Subcommission elected for 2016-2020 there are fifteen other Voting Members. Broad network of Corresponding Members has first of all a responsibility for communication in both directions between the Subcommission and researchers on Silurian topics in their region. Secondly they represent a broad spectrum of specialized stratigraphical disciplines from those countries or regions where Silurian rocks are extensively studied in relation to fundamental and/or applied geological research.

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

Website: [http://silurian.stratigraphy.org/](http://silurian.stratigraphy.org/) contains newsletters, meeting announcements, discussion posting-boards, bibliography of Silurian articles, links to related sites, and other information.

Interface with other international projects / groups

IGCP project no. 652 “Reading geologic time in Paleozoic sedimentary rocks” submitted by Anne-Christine da Silva received unequivocal support from the ISSS. The Subcommission is convinced that broad application of astronomically tuned cyclostratigraphy, combined with radiometric dating and integrated with high-resolution stratigraphy, will lead to substantial improvement of the existing Paleozoic time scale.

Collaboration continues with stratigraphically neighbouring subcommissions on Ordovician (ISOS) and Devonian (SDS) stratigraphy, as documented by numerous international conferences organized in conjunction with the two bodies (Conferences in Lund 2013, Kunming 2014, Ghent 2016, Valencia 2017). The meeting in Valencia joined 4th International Conodont Symposium and SDS annual meeting.

Nominated Officers for 2016-2020:

Chair: Petr Štorch
Vice-Chair: Carlo Corradini
Secretary: Zhan Renbin
4. EXTENT OF NATIONAL/REGIONAL/GLOBAL SUPPORT FROM SOURCES OTHER THAN IUGS

National/regional support has been provided to active members of Aeronian, Telychian and Wenlock GSSP working groups to facilitate their work.

5. CHIEF ACCOMPLISHMENTS IN 2018 (including any publications arising from ICS working groups)

Silurian Times No 25 was edited by the secretary, Renbin Zhan, and distributed in March, 2018, posted on the web site for the ISSS, and circulated as an email attachment to all titular, corresponding and interested members of the Subcommission. It contained the reports on previous meetings, announcements of upcoming meetings and publications, and the latest news and recent publications on Silurian research.

Work continued on the restudy of several potential GSSP candidate sections for the Base of Aeronian (Yuxian section, China; Hlasna Treban section, Czech Republic and Rheidol Gorge section, UK and base of the Telychian (Bajiaomiao section, China and El Pintado Reservoir section, Spain):

Formal proposal of the Hlasna Treban section for new Aeronian GSSP was published (Štorch et al. 2018). Detailed study on morphology, systematics and evolution of *Demirastrites triangulatus* (proposed Rh/Ae boundary marker species) and related graptolites was submitted by Štorch and Melchin for publication in Bulletin of Geosciences. Report on chitinozoan biostratigraphy and fauna is currently in preparation by A. Butcher.

The restudy of the Rheidol Gorge section is nearly complete and full paper presenting the proposal of Rheidol Gorge as a candidate section for the base of the Aeronian Stage is currently in preparation. Results of the study of the chitinozoan faunas and biostratigraphy was presented by De Weirdt et al. (2017) and preliminary report on the overall results was published by Melchin et al. (2018).

Final reports including biostratigraphical, geochemical and geochronological data on the base of Aeronian at the Yuxian section and base of Telychian at the Bajiaomiao section, China by Junxuan Fan et al. are in preparation.


6. SUMMARY OF EXPENDITURE IN 2018:

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>0</td>
</tr>
</tbody>
</table>

7. SUMMARY OF INCOME IN 2018:

<table>
<thead>
<tr>
<th>Carried forward from 2017</th>
<th>US$ 5,250</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICS Allocation</td>
<td>US$ 0</td>
</tr>
<tr>
<td>Total</td>
<td>US$ 5,250</td>
</tr>
</tbody>
</table>

| Balance (carried forward from 2018) | US$ 5,250 |

8. BUDGET REQUESTED FROM ICS IN 2019

| Requested ICS Allocation (see attached document) | US$ 3,000 |

9. WORK PLAN, CRITICAL MILESTONES, ANTICIPATED RESULTS AND COMMUNICATIONS TO BE ACHIEVED NEXT YEAR

- Three ISSS groups working on restudy of the base of the Aeronian GSSP, base of the Telychian GSSP and base of the Wenlock GSSP will continue their study of remaining candidate sections in Yuxian, China (Junxuan Fan et al., Aeronian GSSP); Bajiaomiao, China (Junxuan Fan et al., GSSP of the Telychian stage); El Pintado Reservoir, Spain (David Loydell et al., Telychian GSSP) and presumably also Trannon River section and Dyfnant Forest track section, Wales (David Loydell et al., GSSP of the base of the Wenlock Series). Further submissions of formal GSSP proposals are anticipated for early 2019.
- New results will be discussed within a special session „Silurian odyssey towards advanced Stratigraphy and correlation“ and ISSS Business meeting at 3rd International Congress on Stratigraphy (STRATI 2019) in Milano.
- Further update of the website for Silurian Subcommission by Mr. Hou Xudong. We gratefully acknowledge the support of the Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences for this work.
Potential funding sources external to IUGS

Most of the costs of preparing Silurian Times and research activities of the working groups will be met by local support from host institutions and participation by individuals through national research grants and travel grants from their own authorities.

10. OBJECTIVES AND WORK PLAN FOR NEXT 4 YEARS (2016-2020)

- Principal work will be devoted to GSSP-related research activities – restudy of some previously ratified but currently inadequate basal stratotypes. Research on Aeronian and Telychian GSSP candidates will be completed within this time span and new stratotypes will be chosen. We aimed to vote on these candidate sections in 2019 in Milano but the date is questioned at present by delayed work on some of the candidate sections. Homerian working group will be established. Restudy of the Homerian GSSP will join the program, along with further study on other potential sections suitable for new GSSP of the Wenlock Series.
- Application of astronomically tuned cyclostratigraphy integrated with radiometric data and high-resolution biostratigraphy in conjunction with IGCP no 652 “Reading geologic time in Paleozoic sedimentary rocks”.
- We will work on further development of databases that would bring together and make available information from all sources associated with the Silurian researchers. One such database, operated by the Nanjing Institute of Geology and Palaeontology (Geobiodiversity Database, GBDB), has been named as the official database of the ICS.
- Special session entitled “Silurian odyssey towards advanced stratigraphy and correlation” and ISSS annual business meeting will be held at 3rd International Congress on Stratigraphy “STRATI 2019” in Milano, Italy in July 2-5, 2019. This session will be focussed on GSSP-related research. Vote on new Aeronian stratotype is planned as a principal program point of the ISSS Business meeting.

APPENDIX (Names and Addresses of Current Officers and Voting Members)

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Base of Aeronian GSSP Restudy Working Group
Leader Petr Štorch

Base of Telychian GSSP Restudy Working Group
Leader Michael J. Melchin

Base of Wenlock GSSP Restudy Working Group
Leader David K. Loydell

by Petr Štorch  
Chair, International Subcommission on Silurian Stratigraphy

**************************************************************************
1. Preamble and Definitions

The International Commission on Stratigraphy (ICS) is a permanent commission of the International Union of Geological Sciences (IUGS). The IUGS was founded in Paris on 10 March 1961 and is a member of the International Council of Scientific Unions (ICSU).

The organisational bodies referred to in the statutes are defined as follows:

a. The Executive Committee of ICS comprises two elected officers (Chair, Vice-Chair) and a Secretary General (appointed by the Chair) and two, non-voting, appointed officers (Informatics Officer and Graphics Officer) responsible for the objectives, purpose and daily operation of the commission.

b. Subcommissions of ICS are organisational bodies with specific, long-term scientific tasks and are managed by a chair, a secretary and one or two vice-chairs.
c. The governing and voting body of ICS is the officers of the Executive Committee and the chairs of each of the Subcommissions, and is hereafter named the Voting Commission.

d. Ad Hoc Committees of ICS are organisational bodies with a specific short-term, non-scientific task, such as overseeing procedure, nomination, voting regulation, or ad hoc organisation. Such committees normally consist of a chair and two other members, and are appointed by the Executive Committee, or the management team of a Subcommission.

e. Task (or Working) Groups of ICS are organisational bodies for limited, short-term scientific tasks. Each Task Group addresses a single task; for example, one task can be selecting and defining a stratigraphic boundary stratotype, and another task may be consideration of abandonment of an existing stage and selecting a new one. The chair and secretary of a Task Group are selected either by the Executive Committee, or the management team of the relevant Subcommission.

f. The International Geological Congress, hereinafter referred to as IGC, is determined by the IUGS and by the IUGS statutes. IGC is the quadrennial congress of geological scientists sponsored by IUGS, and organised by an autonomous committee established by the host country or countries.

g. The International Congress on Stratigraphy is sponsored by ICS and will be held every four years. Proposals for future Congresses, which are held during the IGC inter-congress period, are invited by the ICS Executive Committee, which also selects the venue from the proposals received at least two years prior to the proposed event.

2. PURPOSE AND OBJECTIVES

ICS is a body of expert stratigraphers founded for the purpose of promoting and coordinating long-term international cooperation and establishing and maintaining standards in stratigraphy.

Its principal objectives are:

(a) the establishment, publication and revision of the ICS International Chronostratigraphic Chart which is the standard, reference global Geological Time Scale to include the ratified Commission decisions,

(b) the compilation and maintenance of a stratigraphic database centre for the global Earth Sciences,

(c) the unification of regional chronostratigraphic nomenclature by organising and documenting stratigraphic units on a global database,

(d) the promotion of education in stratigraphic methods, and the dissemination of stratigraphic knowledge,

(e) the evaluation of new stratigraphic methods and their integration into a multidisciplinary stratigraphy, and

(f) the definition of principles of stratigraphic classification, terminology and procedure and their publication in guides and glossaries.

The scientific activities shall be carried out through projects or meetings arranged in collaboration with IUGS-affiliated organisations, IUGS-joint programmes, non-governmental bodies and inter-governmental bodies.

3. ORGANISATION

ICS is managed by the Executive Committee.
ICS is organised into Subcommissions, which have longer-term scientific goals. In addition, ICS may create short-term Ad Hoc Committees and short-term Task Groups for specific advice and purpose (cf. also 1e and 1f). The chairs of the Subcommissions and the members of the Executive Committee together form the Voting Commission of ICS that votes on the formal decisions.

4. EXECUTIVE COMMITTEE

The voting officers of the Executive Committee shall be the Chair, a Vice-Chair and the Secretary General. The past chair will ordinarily become consultant ex-officio member of the Executive Committee. All officers serve in an individual capacity. The other officers shall serve as advisors to the Chair and assist him/her in the performance of his/her duties. The Chair and Secretary General are responsible for its daily operation, in accordance with these statutes. The ICS Executive Committee appoints two positions of special service to ICS: the Informatics Officer and the Graphics Officer. These appointments are for 4-year terms that coincide with those of the Executive officers and are renewable.

4.1. Chair

The Chair shall be the chief executive officer of ICS. He/she shall be responsible for the management of its activities within the scope of the authority delegated to him/her by IUGS. He/she shall solicit the advice of the Voting Commission, when necessary, for the administration of ICS and consult with it on matters of major policy and scientific programmes either by correspondence or by meetings.

4.2. Vice-Chair

The Vice-Chair shall serve as chair for the remainder of the term of office if the position of chair should become vacant. The Vice-Chair assists the chairperson with his/her regular duties, activities and work, and in particular oversees stratigraphic standardisation.

4.3. Secretary General

The Secretary General is appointed by the chair of the Executive Committee, and shall assist the chair in his/her administrative and scientific work, and keeps the financial account. He/she shall record the minutes of meetings and organises the votes within the Voting Commission.

4.4. Past Chair

The past chair will ordinarily serve as consultant ex-officio member of the Executive Committee for the four-year period following his/her chair period.

4.5. Informatics Officer

The Informatics Officer is appointed by the Executive Committee and shall manage the ICS website and the ICS-linked stratigraphic database and maintain the ICS archives on the ICS website. As appropriate, the Informatics Officer will provide advice and help to subcommissions developing websites. The position is non-voting and is renewable after each 4-year term with approval of the Executive Committee.

4.6. Graphics Officer
The Graphics Officer is appointed by the Executive Committee and shall design the ICS International Chronostratigraphic Chart, updates and translations of the ICS Chart and designs appropriate for a variety of products. The position is non-voting and is renewable after each 4-year term with approval of the Executive Committee.

5. SUBCOMMISSIONS

Subcommissions of ICS are organisational bodies with specific, longer-term scientific tasks such as the standardisation of stratigraphic units, the documentation and communication of major stratigraphic data to the global earth-science community, and international stratigraphic cooperation. Subcommissions organise ballots (cf. section 9) of their voting members to decide critical scientific issues and subsequently inform the ICS Executive Committee of the result.

5.1. Composition

Each Subcommission shall be managed by a chair and a secretary. One or two vice-chairs may also be elected. Subcommissions report to the Executive Committee, and may be terminated if they become inactive or seriously ineffective, as indicated, for example, by lack of submission of annual reports, failure to respond to ICS communications, and/or show no action for longer than one year.

The voting membership of the Subcommission consists of its management team together with up to twenty members, and is referred to as the Voting Subcommission. Up to twenty voting members shall represent regional and methodological diversity in an appropriate manner. Membership may be terminated if a voting member fails to participate for 6 months or more in the work of the subcommission, and/or does not respond during this time to communications from its chair. Membership may also be terminated for conduct judged to be unprofessional by the ICS Executive Committee in consultation with the Subcommission chair or his/her deputy, as judged appropriate (cf. section 10).

Subcommissions may appoint a reasonable number of corresponding members to advise voting members in achieving the assigned scientific tasks, e.g. participating in boundary working groups. The corresponding membership shall reflect regional and methodological diversity in an appropriate manner.

5.2. Officers

The Chair shall be the leader of the Subcommission. He/she is responsible for the execution of agreed-upon scientific goals and the preparation and the contents of annual scientific and financial reports of the Subcommission. In consultation with the voting members of the Subcommission, he/she shall establish work plans and operating budget requests for the following year.

The Vice-Chair shall serve as chair when the position of chair should become vacant.

The Secretary is appointed by the Chair of the Subcommission, and shall assist the chair with scientific and administrative duties, and is responsible for the organisation of votes within the Subcommission.

5.3. Results

The progress and results of subcommissions are annually reviewed by the Executive Committee. The Executive Committee may dissolve a Subcommission upon completion of
its entrusted mandate or if the Subcommission is inactive. A Subcommission is considered inactive when it no longer elects executive officers, submits annual reports or no longer responds to communications and ballots from the Executive Committee. The decision on dissolution requires consent from IUGS.

5.4. Other Bodies

Subcommissions may appoint such Task Groups (cf. section 7), regional committees or other ad hoc groups, which they consider necessary to fulfill their scientific tasks. These bodies report to the chair of the respective Subcommission.

Subcommissions which are responsible for system or lower ranks of the ICS International Chronostratigraphic Chart shall establish Task (or Working) Groups for the purpose of defining the basal boundaries of component chronostratigraphical/geochronological units, if such boundaries have not previously been defined. Boundary stratotypes are sought to the level of stages, but not at lower chronostratigraphical ranks.

6. AD HOC COMMITTEES

Ad Hoc Committees of ICS are organisational bodies with specific short-term, non-scientific tasks, such as overseeing procedure, nomination, voting regulation, and/or ad hoc organisation.

Committees normally consist of a chair and two other members, and are appointed by the Executive Committee, or the management of a Subcommission of ICS.

The organisation of an Ad Hoc Committee is related to its tasks, and is subject to approval by the ICS body that appointed it.

7. TASK (or WORKING) GROUPS

Task or Working Groups are organisational bodies for limited, short-term stratigraphic tasks. Task Groups are generally organised under individual Subcommissions, but the Executive Committee also may appoint Task Groups for specific tasks that relate to its activities and responsibilities. Commonly, a Task Group is created for the selection and definition of the lower boundaries of chronostratigraphical/geochronological units. Task Groups may also be created for the purpose of replacing and/or selecting new boundary definitions, stage units or other stratigraphical units. Each Task Group will have a single scientific task.

7.1. Task Groups

Task Groups have a four (4) year task that may be extended for additional four (4) year terms as appropriate, depending on sufficient progress with their entrusted task. If, after the eight (8) year allotted period, there is a need to continue, the task group should be dissolved and then reconvened at the discretion of the Subcommission Chair.

7.2. Officers and Members

Officers of a Task Group are the leader, and where deemed appropriate, a secretary. These officers are selected either by the Executive Committee, or by the management of Subcommissions, depending under which body the Task Group resides, and are expected to behave in the spirit of Section 10.

Task Groups may appoint a reasonable number of members that represent regional
and/or methodological diversity in an appropriate manner (nor exceeding 40 members). Membership may be terminated if the member does not respond to communications from its Task Group chair for 6 months.

7.3. Results

The progress and results of Task Groups are annually reviewed by the Subcommission and/or Executive Committee under which they reside. Task Groups may be terminated if they fail to respond to communications from the individual Subcommission or Executive Committee under which they reside.

7.4. Voting

Task Groups organise ballots (cf. section 9) of their voting members to decide critical scientific issues and subsequently inform the Subcommission or Executive Committee under which they reside of the result.

7.5. Terms of Office

Task Groups are automatically dissolved once they have fulfilled their objective, scheduled until the objective is completed, with an expected maximum duration of eight years (cf. section 7.1).

8. ESTABLISHMENT AND DISSOLUTION OF ICS CONSTITUENT BODIES

8.1. Subcommissions

New Subcommissions shall be established when the Executive Committee of ICS is convinced of the necessity, and makes a recommendation for the establishment of a new Subcommission first to the Voting Commission and then to IUGS. When consent is given by the Voting Commission and IUGS, the ICS Executive Committee shall appoint a temporary Subcommission chair and optionally a vice-chair. For subsequent terms of office, elections shall be held within the Subcommission by a quorum of its own voting members. Voting members of a newly formed Subcommission are elected by its officers (cf. section 9.6).

The dissolution of Subcommissions requires the consent of IUGS, based on recommendations by the ICS Executive Committee (cf. sections 5.3 and 10).

8.2. Ad Hoc Committees

Ad Hoc Committees may be established and dissolved by decision of the ICS Executive Committee. Ad Hoc Committees may be reorganised or regrouped with other ICS bodies by decision of the Voting Commission of ICS.

8.3. Task Groups

Task Groups (cf. section 7) may be established and dissolved by decision of the Executive Committee of ICS and/or the management of Subcommissions under which the Task Group resides.

9. TERMS OF OFFICE, ELECTIONS AND VOTING

9.1. Terms of Office for Officers
The terms of office for the officers of the Executive Committee, the Subcommissions, Ad Hoc Committees, and Task Groups shall be the period between two IGCs, normally four (4) years. All officers can be re-elected or re-appointed (Secretary General, Informatics Officer, and Graphics Officer) for one additional term of four (4) years. If circumstances necessitate the term of office to begin in the interval between two IGCs, the period of office will not be extended beyond the second IGC after the officer started in his/her function.

9.2. Terms of Office for Voting Members

The terms of office for the voting members of Subcommissions and Task Groups shall be the period between two IGCs, normally four (4) years, and can be extended for a maximum of two additional four (4) year periods.

9.3. Election of the ICS Executive Committee

Eighteen (18) months prior to the International Geological Congress, the Executive Committee appoints the chair of the Nominating Committee, which shall not include any of the Executive Committee. The chair of the Nominating Committee shall select two (2) additional Nominating Committee members.

The Nominating Committee shall invite proposals from all Subcommissions of ICS of candidates for the positions of Chair and Vice-Chair of the Executive Committee, but the Committee shall not be restricted thereby in its choice of candidates. The Chair and Vice-Chair of the Executive Committee may request re-election for one term beyond their first period of office (cf. section 9.1).

The Nominating Committee shall evaluate the merits of all proposed candidates for each position, taking into consideration their scientific qualification, managerial capability and willingness to serve. The Committee shall nominate to the ICS Chair at least two candidates for each of the two elected positions no later than twelve (12) months prior to the next IGC, bearing in mind geographical and disciplinary diversity in order to ensure that the principal schools of stratigraphic thought are represented in the Executive Committee.

Upon receipt of the Nominating Committee's submission, the Secretary General shall promptly circulate the proposal of nominated candidates to all the members of the Voting Commission for voting and election (cf. also 1c and 9.7).

The election requires approval by IUGS Executive Committee and ratification by the IUGS-IGC Council.

9.4. Election of the managing committee of a Subcommission

A chair and two optional vice-chairs of a Subcommission of ICS are proposed to ICS after appropriate ballot within each Subcommission. From these candidates, the new officers are subsequently elected by the Voting Members of the Commission (cf. section 1c) by ballot to be mailed by the general secretary not later than twelve (12) months prior to the next IGC. A secretary is appointed by the chair following his/her election. All members of the managing committee of Subcommissions are approved and ratified by the ICS Executive Committee.

9.5. Election of the leaders of Task Groups
The leaders (chair and secretary, as required) of a Task Group are proposed by the management team of the Subcommission or the Executive Committee of ICS under which the Task Group resides. Task Group leaders are confirmed by normal voting procedures in the ICS Subcommission or ICS Executive Committee under which they reside.

9.6. Election of the Voting Members of Subcommissions and Task Groups

Voting members of new Subcommissions are elected by its initial executive. New voting members of existing Subcommission are elected by its executive, upon consultation with existing voting members, and confirmed by the Executive Committee of ICS.

Voting members of Task Groups are elected by its executive, in consultation with existing voting members, and confirmed by the management or executive of the ICS body under which the Task Group resides.

9.7. Voting Procedures in ICS

The members of the Voting Commission (cf. section 1c), Subcommissions and Task Groups make their decisions by vote. For approval, all decisions, including elections, require a sixty percent (60%) majority of delivered votes, provided that a quorum of 60% has been attained. In cases where no quorum is attained the first round, a second round of voting is organised. Elections with more than one candidate will require the winner of a relative majority of less than 60% to pass a second ballot listing only him/herself, where he/she has to receive a 60% confirmation.

Voting shall be conducted by electronic mail (e-mail), giving a deadline of thirty (30) calendar days for the receipt of the votes. Voting Members may vote "yes," "no" or "abstain". Formal meetings of ICS that attain a quorum of 60% can arrange in-session ballots. Integrity of the voting process must be maintained. Discussion must take place and be allowed to run its course before ballots are distributed. Once ballots have been distributed, no voting member shall circulate materials or arguments intended to influence the vote of other voting members. A voting member doing so will have his/her ballot disqualified and will be reprimanded by the appropriate subcommission chair.

10. PROFESSIONAL BEHAVIOUR

It is expected that all voting members and officers of ICS, subcommissions, task groups and ad hoc groups will treat others with respect and will maintain the integrity of the voting process when votes are taken. Discussions whether orally or written (e.g. e-mail) can be contentious. Disrespectful and unprofessional comments directed at other individuals are not tolerated. Should they occur, the matter will initially be dealt with by the Subcommission chair or his/her deputy, the chair of the appropriate body is then required to report such incidents to ICS Executive Committee, which after a fair investigation can issue a reprimand or termination of the membership of the guilty party. Violations of the integrity of the voting process (cf. section 9.7) will result in disqualification of the ballot submitted by the violator and a letter of reprimand.

11. RATIFICATIONS

11.1. Ratifications by ICS

The ICS Executive Committee ratifies:
a. Election or appointment of officers (management) in subcommissions.
b. Election or appointment of voting members of subcommissions

11.2. Ratifications by IUGS

IUGS ratifies elections made by the Voting Commission of ICS, including:

a. The nomination of members of the Executive Committee,
b. Stratigraphic standards like GSSPs, formal stratigraphic stage names and units of other ranks,
c. Abolition of and/or establishment of new Subcommissions,
d. The ICS Statutes.

11.3. Ratification by the IUGS-IGC Council

Members of the ICS Executive Committee must also be ratified by the IUGS-IGC Council.

12. MEETINGS

The Executive Committee shall meet at the request of the Chair or of any two other officers of the Executive Committee.

The Voting Commission of ICS shall meet during the International Geological Congress. Additional formal meetings of the Voting Commission may be called by the Chair of ICS with the advice of the Executive Committee. Formal meetings of ICS that attain a quorum of at least 60% can arrange in-session ballots.

All Subcommissions shall endeavor to hold at least one meeting during each International Geological Congress. They are encouraged to organise additional meetings during major international conferences on their field of scientific expertise. Task Groups are also encouraged to have formal meetings during each International Geological Congress, and organise additional meetings during major international conferences on their field of scientific expertise. Formal meetings of Subcommissions and Task Groups that attain a quorum of at least 60% can arrange in-session ballots.

13. ANNUAL REPORTS

13.1. Subcommissions, Task Groups and Ad Hoc Committee Reports

The chairs of the Subcommissions shall transmit annual reports to the Secretary General of ICS no later than the first of November of each year. The annual reports shall include an overview of the scientific activities and achievements, together with the statement of operating accounts, for the current year and work plans and anticipated achievements, with the operating budget request, for the following year. In the case of Subcommissions with constituent bodies, these Subcommissions reports shall include the scientific achievements and plans of these bodies.

Chairs of Task Groups and Ad Hoc Committees shall transmit annual reports to the chair of the ICS body under which they reside. They are also responsible for including the group’s operating costs in that report and projected budget for the new reporting period.

13.2. Commission Report

The Chair of ICS shall submit a consolidated annual report on behalf of ICS to the
IUGS Executive Committee at the time stipulated by that IUGS Executive Committee via its secretariat.

The ICS report shall contain (1) the reports of the individual Subcommissions, Task Groups and Ad Hoc Committees, and (2) an executive document that:

- a. provides an executive summary report,
- b. highlights the scientific achievements of the constituent ICS bodies,
- c. communicates all formal decisions taken by the Voting Commission of ICS,
- d. reports on administrative matters of ICS,
- e. provides a consolidated statement of ICS's operating accounts for the current year, and
- f. submits the work plans and recommends a consolidated operating budget request of ICS for the following year.

The ICS annual report shall be made available to the management of all Subcommissions.

14. ICS WEBSITE AS AN OFFICIAL ARCHIVE

The ICS website is the official archive of the ICS International Chronostratigraphic Chart and Table of GSSPs. These are the responsibility of ICS Executive, particularly the Informatics and Graphics officers at direction of the ICS Chair. Documents to be made available on the website include the ICS statutes and official correspondence between the ICS and IUGS EC regarding GSSP and other ratification decisions.

15. GEOBIODIVERSITY DATABASE (GBDB)

Stratigraphic information, including all relevant litho-, bio- and chronostratigraphic data together with any non-biological data, from GSSP proposals submitted to ICS voting members must be entered in the Geobiodiversity Database, in cooperation with, and supported by GBDB staff.

16. ENTRY INTO FORCE AND AMENDMENTS TO STATUTES

These statutes are now in force having been approved by ICS on 24 March 2017 and ratified by the IUGS Executive Committee on 25 April 2017. These statutes are based upon but also significantly revised from those approved by ICS on 28 August 2001, and accepted with minor modifications by IUGS in February 2002, which, in turn, supersede the statutes accepted by IUGS at its annual meeting, 15-18 January 1997.
REPORTS OF ACTIVITIES IN 2018

1. Report from the Base of the Aeronian GSSP Restudy Working Group  
   by Petr Štorch (Institute of Geology of the Czech Academy of Sciences, Czech Republic)

   My report on Aeronian working group is a bit more delicate affair. I am done with Czech candidate section. Recent paper described proposed boundary marker species and related taxa (Štorch and Melchin, 2018). I have to contact Junxuan Fan once more and ask him for news on Chinese Yuxian section. Last time, I did not hear from him. I am afraid that he also did not receive my message although it did not indicate as undelivered. As for the Rheidol Gorge section, there are no news from UK although formal proposal should have been submitted last year.

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2. Report from the Base of the Wenlock GSSP Restudy Working Group  
   by David Loydell (University of Portsmouth, UK)

   A full update on my ongoing activities regarding this boundary will be presented at STRATI in July this year. Currently I am working through the samples collected from the highly expanded (by distal turbidites) Trannon section in central Wales. Examination of material from the Dyfnant Forest section, also in Wales, is near completion. The aim of course is to find a replacement for the Hughley Brook section (the existing GSSP), a section for which there is little enthusiasm. I have not been contacted by anyone who has identified any new potentially suitable replacement GSSP. This is in part no doubt because of the very limited number of people actively working on this stratigraphical interval (attention in recent years, including my own, having been focused on documenting boundaries where good sections have been identified, i.e. base Aeronian, base Telychian and base Homerian).

   If you are in the process of documenting a good section through the uppermost Telychian through to the lower Sheinwoodian, with potential to act as a new GSSP for the base of the Wenlock Series, I would be delighted to hear from you.

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   by André Desrochers (University of Ottawa, Canada)

   More than 900 earth science specialists participated in the International Sedimentological Congress, sponsored by the International Association of Sedimentologists, to discuss the latest advances in the broad field sedimentology in Quebec City from August 13 to 17, 2018. Following the congress, 18 participants from all
over the world visited the Lower Palaeozoic sections superbly exposed on Anticosti Island in the Gulf of St-Lawrence. This field excursion provided an introduction of the Upper Ordovician to Lower Silurian sedimentary geology of Anticosti Island which consists of approximately 900 m of undeformed fossil-rich limestone and minor siliciclastic rocks that were deposited on a storm-dominated tropical carbonate ramp. Participants examined the multi-order, orbital-scale sedimentary cycles present in the Katian Vauréal Formation; the classic O/S boundary outcrops of the upper Vauréal-Ellis Bay-lower Becscie formations within a modern multi-proxy stratigraphic framework; the Late Hirnantian microbial-metazoan reef complexes and oncolites associated with a major far-field Hirnantian deglacial event; and the thick Llandovery carbonate succession of Anticosti Island including superb karsted hardground omission surfaces present in the Telychian Chicotte Formation. The 6-day field excursion was a fantastic way to conclude a very successful congress for all participants.

Photo 1: Field trip participants about to leave the island after six days to examine key sections of the Anticosti succession.

Photo 2: Lunch stop along the Lousy Cove at the eastern end of Anticosti Island with the Hirnantian Ellis Bay strata in the background.
4. Report on the 8th International Brachiopod Congress

by Lucia Angiolini (Italy)

Brachiopods in a changing planet: from the past to the future

Between the 10th and 14th of September 2018, the 8th International Brachiopod Congress took place in the prestigious venue of the University of Milan, after the previous editions held in Melbourne (Australia) in 2010 and in Nanjing (China) in 2015. It was the first time, since its foundation over 35 years ago, that this important conference was hosted in Italy.

The Congress was attended by 150 participants from universities and research institutes from all over the world (Argentina, Armenia, Austria, Belgium, Canada, China, Czech Republic, Denmark, France, Germany, Hungary, Iran, Israel, Italy, Japan, New Zealand, Poland, Russia, Slovakia, Spain, Sweden, United Kingdom and USA).

Brachiopods are a group of marine invertebrates known since the Cambrian, that show a high biodiversity and a dominant role mainly in the Palaeozoic oceans. They are considered one of the best biomineral archive, due to the unique characters of their shells, to understand the evolution of marine calcifiers during climate and environmental changes in the recent and deep geological past.

The topics of the Congress have touched all aspects of the study of brachiopods, from systematics and evolution to biostratigraphy, palaeoecology, palaeobiogeography, up to the biology of recent taxa. Particular emphasis was devoted to research on mass extinctions, biomineralization and geochemistry, as well as new methods of microscopic investigation with the latest equipment in this field.

Interesting talks included new findings on the process of shell formation, and on the steps of its possible diagenetic alteration, and multidisciplinary studies on how brachiopods and their shells respond to ocean acidification both in culturing and natural environment and in the geological record. Advancements in brachiopod research were also testified by new
discoveries on their phylogeny and taxonomy, as well as on palaeoecology and taphonomy, and on how they could survive and recover after biotic crises, such as the big ones of the end-Ordovician or the end-Permian, ending up with new approaches in shell geochemical analyses.

Four abstracts have been presented on Silurian topics:

1. Zhou H., Huang B. Population analysis of the Silurian brachiopod *Atrypoidea foxi* Jones from Qujing, Yunnan Province
2. Jin J. Morphological plasticity in the early diversification of the post-extinction Silurian pentameride fauna
3. Jansen U. Evolution, stratigraphy and palaeobiogeography of Late Pridolian–Early Eifelian brachiopods from the Rhenish Massif (Germany)
4. Leone M. F., Benedetto J. L. Phylogenetic relationships of the Silurian Afro-South American Realm rhynchonellide brachiopods *Anabaia, Harringtonina* and *Clarkeia*: new insights from their ontogeny

The abstract volume of the congress can be downloaded at http://permian.stratigraphy.org/files/20180828212711700.pdf

In addition to the oral and poster scientific sessions and two prestigious plenary lectures, the Congress was preceded and followed by three field trips (Spain, United Kingdom and Sicily), as well as by two mid-congress day excursions only a short distance from Milan (Castell'Arquato and Grigna Mountains). Participants had the possibility to discover the wonderful fossiliferous localities of Italy and Europe.

Sometimes released into the background, invertebrate macropalaeontology has a high scientific potential; macrofossils are excellent archives of data which help palaeontologists to understand the lesson from the geological past to interpret our future. The 8th International Brachiopod Congress just held in Milan, with its numerous oral and poster presentations, is a clear evidence of that. The brachiopod community has proved to be very active, with a lot of young students and researchers involved in the development of new studies and projects. An example of that is the BASE-LiNE Earth Project, founded by the European community with 21 partners (lead by GEOMAR, Kiel), which produced very innovative multi- and interdisciplinary researches (https://www.baseline-earth.eu/)

Chair of the Congress: Lucia Angiolini and Renato Posenato


Organizing Committee: Crippa G., Brandolese V., Garbelli C., Henkel D., Romanin M., Ye F.

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GUIDELINES FOR THE ISSS AWARD: KOREN' AWARD

Description: This award is intended to recognize and encourage excellence in research related to Silurian stratigraphy and paleontology by younger researchers. It will be presented every four years at the Silurian Symposium.

It is proposed that this award be formally termed the "Koren' Award" in honor of the late Dr. Tatiana Koren' (1935-2010), former Secretary and Vice Chair of the Silurian Subcommission (as well as member of Ordovician and Devonian subcommissions) and a global expert on graptolites who made many lasting contributions to the biostratigraphy of the Silurian System (see Memorial in 2011 in Silurian Times (No. 18) and Ordovician News (No. 28)).

Selection Procedure: Recipient of this award will be based on nominations from voting (titular) members of the Silurian Subcommission overseen by a committee of three titular members. The nomination will consist of an updated CV, including list of publications relevant to Silurian stratigraphy and letter or letters of recommendation from one or two or several voting members of ISSS. Letters should emphasize the fit of the nominee for the criteria listed below.

The nominations will be reviewed by the committee on awards (presently Carl Brett, Renbin Zhan and Petr Štorch) who will prepare a slate of candidates including brief synoptic biographies that will be voted upon by all titular members. The candidate receiving the largest number of votes will receive the award.

Criteria for selection: The candidate may be chosen from among any paleontologists/stratigraphers who fit the following criteria:

A successful candidate should:

1) be 40 years of age or younger.
2) possess a graduate degree (ideally PhD, although candidates with masters degrees may be considered).
3) have completed at least five years of professional research (PhD studies included).
4) have a substantial record of publication (mostly senior authored) related to Silurian stratigraphy, paleontology, paleobiology, paleobiogeography or paleoceanography, etc. in peer-reviewed journals.
5) be actively contributing to Silurian research at the time of the award.
6) demonstrate an outstanding ability to communicate ideas verbally (as in conference talks) and in writing.
7) be supported by two or more titular members of the Silurian Subcommission.

Besides, the ISSS will avoid awarding two continuous recipients from the same country or state in 8 years.

Certificate and bonus: Each winner of the "Koren' Award" will receive a formal Certificate issued by ISSS with the Chair's signature and $300US as bonus, both of which will be awarded at the closing ceremony of each Silurian Symposium every four years.
ANNOUNCEMENTS OF SILURIAN RELATED MEETINGS
AND ACTIVITIES IN 2019

STRATI 2019 - Scientific program

Guidelines for the Convenors

General organization of the session

The daily schedule of the congress is organized with two time-slices of 2.5 hours for oral presentations, one in the morning and one in the afternoon. The minimum duration of each session is one time-slice, equivalent to 2.5 hours.

Talks will be 15 minutes-long including discussion, therefore the minimum number of oral presentations for a session is 10 (2.5 hours total). A session may include a keynote speech of 30 minutes, in this case the minimum number of oral presentations is 1 keynote+8 oral presentations (2.5 hours total). The invitation for the keynote speech is left to the Convenors. However, no funding is available to cover the attendance of keynote speakers.

Every participant may submit only one abstract for oral presentation and one for poster presentation. The presenting Author must be in compliance with the payment of the registration fee by the deadline of the Abstract submission.

The submission form includes the selection of the session, but also the possibility to choose an alternative session. If a session does not receive a sufficient number of abstracts there are two solutions: a) merging of this session with another, closely related, session or b) the session becomes a poster session with no oral presentations.

Schedule

Deadline for abstract submissions: March 10th.
Beginning of the review of the abstracts: March 18th.
Deadline for abstract review, their acceptance and possible shifting/merging of sessions: April 7th.
Publication of the program on the website: April 19th.

Review of the submitted abstracts

The Convenors 1 will receive a password to access the system and verify the submission of the abstracts to the session. Co-convenors may share the password, but only one Convenor can access at a time. We warmly encourage the Convenors 1 to start checking the submissions on a regular basis during the submission period before the deadline. This may be useful in order: 1) to verify if it is necessary to solicit the submissions of contributions and 2) to smooth and speed up the final review of the abstracts.

The review of the Abstracts will be done exclusively online, by accessing the system. Convenors will be able to see the list of the Abstracts submitted, read the text, decide to
keep or move abstracts to a different session, allocate individual abstract to an oral or poster presentation.

Convenors will have to define the chronological succession of the oral presentations.

Abstracts not consistent with the topic of the session will be shifted to a more appropriate one.

Decision will be made by Convenors 1 in agreement with co-convenors, and taking into account the alternative session suggested by the Author in the submission form.

The general planning of the sessions will be set up by the Scientific and Organizing Committees. In case of specific cases, please contact marco.balini@unimi.it and elisabetta.erba@unimi.it. We will monitor the submission of the abstracts and their evaluation. Please, let us know as soon as possible if you have other commitments during the evaluation procedure. In case Convenors are inactive, we will take the appropriate actions in close cooperation with the Scientific Committee.

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15th INTERNATIONAL SYMPOSIUM ON EARLY AND LOWER VERTEBRATES QUJING, YUNNAN
PROVINCE, CHINA
August 8th – 13th 2019

FIRST CIRCULAR

Pre-Conference Field Trip: Zhangjiajie, Hunan (Silurian-Devonian)
Post-Conference Field Trip: Qujing and neighboring cities, Yunnan (Cambrian-Triassic)

Dear Colleagues,

On behalf of the Organising Committee, we are particularly pleased to invite you to China for the 15th International Symposium on Early and Lower Vertebrates (ISELV). The Symposia on Early and Lower Vertebrates are the only recurring international meetings targeted specifically towards the Palaeozoic vertebrate research community. The 15th ISELV will be organized between August 8th – 13th 2019 at Qujing Normal University (http://www.qjnu.edu.cn/english/), Qujing, Yunnan, China.

Qujing, about 130 kilometres northeast of Kunming, is well known for the richness of the Early Devonian vertebrate fossils during the past century. Recently, Qujing further astonished researchers by the discovery of three-dimensional and articulated late Silurian jawed vertebrates. Posters and platform presentations are accepted on an open and competitive basis and students are encouraged to present. Topics of presentations will range from the earliest chordates up to the origin and early radiation of land vertebrates. Please find some basic information below. We will inform you about further details in the
second circular. Please do not hesitate to contact Jing Lu (lujing@ivpp.ac.cn) or Tuo Qiao (qiaotuo@ivpp.ac.cn) if you have any queries.

Please distribute this message among your colleagues, students and everybody who might be interested in participating this event. Please send your pre-registration using the attached form at your earliest convenience.

We are looking forward to seeing you in Qujing, China in 2019!

15th ISELV Organising Committee:
- Min Zhu (chairman)
- Wen-jin Zhao (vice-chair)
- Zhi-kun Gai, Jing Lu, Tuo Qiao
- You-an Zhu, Lian-tao Jia, Zhao-hui Pan
- Xiao-dong Shi, Qiang Li, Zhi-gang Wang

PRELIMINARY PROGRAMME

Thursday, 8th August
- Registration followed by the welcome icebreaking party

Friday, 9th August
- AM. opening and Gavin Young session: The transition from jawless to jawed vertebrates
- PM. Agnathans: life before jaws/poster session

Saturday, 10th August
- AM. The origin of modern jawed vertebrates
- PM. Morphology and evolution of actinopterygians/poster session

Sunday, 11th August
- Conference Field Trip: core sites of Xitun Fauna (Lower Devonian) and Xiaoxiang Fauna (Silurian)

Monday, 12th August
- AM. Losing the bones: acanthodian and chondrichthyan morphology and histology
- PM. General session/poster session

Tuesday, 13th August
- AM. Early sarcopterygians: fishy ancestors and how they crawled onto land
- PM. General session/closing session

REGISTRATION FEE
- Early bird (before March 15th, 2019) registration fee (US$350), student registration
fee (US$250);

Regular registration fee (US$450), student registration fee (US$350).

* The fee includes the meals and the city transportation during the symposium. But NOT include accommodation. Further details will be sent in the next circular to those who pre-register, in January 2019.

IMPORTANT DATES

Pre-registration: the end of 2018 (attached Pre-registration form ISELV China 2019);
Early bird registration: 31st March 2019;
General registration: 30th June 2019;
Abstracts submission deadline: 30th April 2019

ACCOMMODATION

**Anxia Hotel Qujing:** A friendly and convenient hotel not far away from Qujing Normal University (about 3.4 km and 45 mins by walking).

Discounted price: ca US$30 for a twin share room, ca US$45 for a single room, one night. Breakfast included.
Address: Xiyuan Community, West Cuifeng Road, 655000 Qujing, China.

**Guanfang Hotel Qujing:** the only 4-star hotel in Qujing, located at the city centre, about 8km away from Qujing Normal University.

Discounted price: ca US$60 for a twin share room, ca US$70 for a single room, one night. Breakfast included.
TRANSPORTING

The committee will provide attendees transportations by bus from Kunming Changshui International Airport to the hotel at 7th to 8th August from 8 AM – 10 PM. If your flight is NOT fitted in the above time table or you have any queries, please do not hesitate to contact Jing Lu (lujing@ivpp.ac.cn) or Tuo Qiao (qiaotuo@ivpp.ac.cn).

FIELD TRIPS

**Pre-Conference Field Trip** (4th – 8th August, 2019): Siluro-Devonian sections and fossil sites in Zhangjiajie Region, Hunan Province

- **Organizers:** Wen-jin Zhao, Zhi-kun Gai
- **Min-Max Number of Participants:** 15/40
- **Cost:** per person ca US$600 including 4-night accommodations, meals and transportations in Hunan Province, and the high-speed train ticket to Qujing.

**Route:** Changsha (the capital of Hunan) – Zhangjiajie – Lixian – Changde – Qujing

**Day 1** (Sunday, 4th August 2019): (Arrival) Changsha. We will stay in Changsha at night (included in the cost).

**Day 2** (Monday, 5th August 2019): Drive to the Wentang Section from Changsha to examine the fossil sites yielding the Zhangjiajie Vertebrate Fauna (consisting of the Wentang and Maoshan vertebrate assemblages) and the Xiaoxiang Vertebrate Fauna. We will stay in Zhangjiajie at night.

**Day 3** (Tuesday, 6th August 2019): Drive to the Zhangjiajie Section to examine the Siluro-Devonian strata. Also stay in Zhangjiajie at night.

**Day 4** (Wednesday, 7th August 2019): Drive to the Shanmen Reservoir Section to examine the fossil sites yielding the Zhangjiajie Vertebrate Fauna (consisting of the Wentang and Maoshan vertebrate assemblages) and the Xiaoxiang Vertebrate Fauna. After the investigation, we will drive to Changde City and spend the night.

**Day 5** (Thursday, 8th August 2019): After breakfast, we will drive to Changsha and go to Qujing by the high-speed train.
Post-Conference Field Trip (14th – 18th August, 2019): Cambrian-Triassic Vertebrate sites, Yunnan Province
Organizers: Min Zhu, Wen-jin Zhao, Zhi-kun Gai, Qiang Li
Min-Max Number of Participants: 15/40
Cost: per person ca US$500, including 4-night accommodations, meals and transportations in Yunnan Province
Route: Qujing – Fuyuan – Luoping – Chengjiang – Wuding – Kunming
Day 1 (Thursday, 14th August 2019): Drive to the Pearl River Source Scenic Area to examine the Siluro-Devonian strata, and then travel to investigate Dahe Paleolithic Site close to Fuyuan County. We will stay in Fuyuan at night.

Day 2 (Friday, 15th August 2019): Drive to Luoping County to examine the fossil sites yielding the Luoping Biota (Middle Triassic) and visit Luoping Museum. We will stay in Luoping County at night.
Luoping Biota is one of the most diverse Triassic marine fossil Lagerstätten in the world, providing a new and early window on recovery and radiation of Triassic marine ecosystems some 10 Myr after the end-Permian mass extinction. The recently discovered exceptionally preserved Luoping biota from the Anisian Stage of the Middle Triassic, Yunnan Province and southwest China shows this final stage of community assembly on the continental shelf. The fossil assemblage is a mixture of marine animals, including abundant lightly sclerotized arthropods, associated with fishes, marine reptiles, bivalves, gastropods, belemnoids, ammonoids, echinoderms, brachiopods, conodonts and foraminifers, as well as plants and rare arthropods from nearby land. In some ways, the Luoping biota rebuilt the framework of the pre-extinction latest Permian marine ecosystem, but it differed too in profound ways.
Luoping Biota National Geopark and the life reconstruction of Luoping Biota by Brian Choo

**Day 3** (Saturday, 16th August 2019): Drive to Chengjiang County to examine the fossil sites yielding the Chengjiang Fauna (Cambrian). We will stay in Chengjiang County at night.

**Chengjiang Fauna (Cambrian):** Chengjiang’s fossils present the most complete record of an early Cambrian marine community with exceptionally preserved biota, displaying the anatomy of hard and soft tissues in a very wide variety of organisms, invertebrate and vertebrate. They record the early establishment of a complex marine ecosystem. The site documents at least sixteen phyla and a variety of enigmatic groups as well as about 196 species, presenting exceptional testimony to the rapid diversification of life on Earth 530 million years ago, when almost all of today’s major animal groups emerged.

Fossil site of the Chengjiang Fauna (left, image from internet) and the life reconstruction of the Chengjiang Fauna by Nobu Tamura (right)

**Day 4** (Sunday, 17th August 2019): Drive to Wuding County to examine the fossil sites yielding the Jiucheng Fauna (Early Devonian) and Haikou Fauna (Middle Devonian). We will travel to Kunming (the capital of Yunnan Province) and stay in Kunming at night.

Far view of the fossil site of Jiucheng Fauna (left) and the fossil site of Haikou Fauna (right)

**Day 5** (Monday, 18th August 2019): We will dismiss in the hotel of Kunming.
Mohammed AL-MUSAWI (USA). I am working on redefining the stratigraphy of the Llandovery section in the Michigan Basin by using an integrated data set includes carbon isotope, strontium isotope, and conodont data.

Mohammed Al-Musawi (graduate student)
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Fernando ALVAREZ (Spain). In recent years, I have been continuously working on the Early to Middle Palaeozoic (of course including Silurian) brachiopods from Spain and some other places, and have some relevant publications from time to time.

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Anna ANTOSHKINA (Russia). I am actively working on Upper Ordovician and Silurian bioevents and palaeogeography. I am also interested in sequence stratigraphy and evolution of sedimentary basins. The project, Ordovician–Silurian boundary and Hirnantian strata exposed on the northern and subpolar Urals together with my young colleague Lyubov’ Shmeleva is finished. A complex study on the significance and nature of ooids, concretions in some Ordovician, Silurian, and Lower Carboniferous deposits of the northern and subpolar Urals, and Chernyshev Swell have revealed a distinct signal of microbial activity, and the results have been published.

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Kyi-Pyar-AUNG (Myanmar). I am working on Silurian graptolites from Myanmar. I also continue to work on stratigraphy of the Ordovician and Silurian sequences in Myanmar.

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Chris BARNES (Canada). I am continuing Silurian conodont palaeontology/stratigraphy/isotope geochemistry research. The main current projects are: a) Ordovician and Silurian conodont biostratigraphy, bioevents, eustasy, and thermal maturation; b) analysis of the effects of climate, eustasy and tectonics on conodont evolution and ecology during the early Palaeozoic from the major database developed from a half-century of sampling throughout the Canadian part of Laurentia; and c) early Silurian microvertebrate assemblages from the Cape Phillips Formation, Sheills Peninsula, Devon Island, Nunavut, Canada (with Susan Turner (Queensland Museum) and David Sprague (Calgary)).

Chris R. Barnes (Professor Emeritus)  
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James BARRICK (USA). I have retired from teaching, but will remain at Texas Tech for a while to write up unfinished projects on Silurian conodonts.

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Richard Batchelor (Honorary Research Fellow)  
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Juan Luis BENEDETTO (Argentina). I am working on the brachiopod faunas across the Hirnantian/Rhuddanian boundary from the Precordillera basin of western Argentina (Cuyania terrane) in order to shed light on the end-Ordovician mass extinction in the circumpolar region of Gondwana. This project, which is being carried out in collaboration with the doctoral student Florencia Leone, also focuses on the subsequent recovery during the early Silurian and aims to identify those physical and biotic factors leading to the emergence of the Afro-South American Realm. This study is based on the rich brachiopods faunas from the La Chilca (Llandovery) and Los Espejos (Wenlock-Pridoli) formations of west-central Argentina. Particular interest is being devoted to the phylectic lineage starting with Anabaia in the early Llandovery culminating with Clarkea in the late Silurian. A taxonomic revision of the genus Dalmamella from the Hirnantian and Rhuddanian strata from the Precordillera basin has recently been accepted for publication. This study also addressed the size changes of the species *D. testudinaria* across the
end-Ordovician biotic crisis.

Juan Luis Benedetto (Prof.)
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Stig M. Bergström
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Alain BLIECK (France). I left my office at the University of Lille last year, and I am now working at home. I am not using the university email address anymore.

Alain R.M. Blieck (Ph.D.)
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Olga BOGOLEPOVA (Russia). I am working on some unfinished papers (unpublished CASP reports) on Silurian material from the Russian high Arctic and Russia (Caucasus and the Urals).

If of interest, a unique collection of Cambrian to Cretaceous palaeontological and other geological samples, collected during a number of expeditions to the Eurasian high Arctic (Taimyr, Severnaya Zemlya, Novaya Zemlya, the New Siberian islands, Polar Urals and northern Siberia), data that have not been sufficiently presented to the scientific community so far are available. Just contact me for more information.

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Joe BOTTING (UK). I mainly work in the Ordovician Period, but have been drifting into the Silurian recently, particularly in relation to the aftermath of the Hirnantian Mass Extinction in South China (see ref below). I'm also working on other occurrences of Silurian sponges, which are extremely poorly known, and have several papers in at least the planning stage that are studying a range of new taxa from various areas, but especially Wales and the Welsh Borders (UK). I'm also working on a paper about Silurian sponges
from the Urals with Rustem Yakupov, and have a Scottish (Pentlands) sponge in press with Yves Candela. There is also a pile of Silurian sponges from Estonia that I should be involved with writing up at some point.

Despite the appearance that non-lithistid sponges were very minor components of the Silurian faunas around the Welsh Basin, it turns out that this may be due largely to limited preservation. We have isolated occurrences from several sites in the Ludlow rocks of Mid Wales, an important fauna from the Shucknall hill area of Herefordshire, overlooked sponges from an old classic site (Leintwardine) and have recently discovered three-dimensionally preserved sponges in Wenlock concretions of Powys. Although my focus is on sponge evolution, this work has a lot of implications for the palaeoecology of these sequences, and I'm always interested in the total assemblages and the real nature of the life community. All of these are in the early stages of writing up, but at least I have good intentions!

_Thought for the year (and every year):_ Everyone assumes that the 'classic' areas (like the Welsh Borders) have been 'done'. Don't believe it; there's an amazing amount of new stuff still coming out, and some of it is really quite important.

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**Carlton BRETT (USA).** In the past year, I continued working with several colleagues on Silurian sequence, chemo- and event stratigraphy and palaeoecology of southern Laurentia and comparisons with other regions. Research is divided into about three project areas.

A) **Research on Silurian Sequence and Chemostratigraphy:**
Ohio-Kentucky-Indiana-Tennessee, Canada (with Indiana and Ohio Geological Surveys)

This year efforts were largely focused on aspects of Silurian stratigraphy in Indiana and northern Kentucky in the Louisville, Kentucky-Jeffersonville, Indiana and in northern Indiana. Pat McLaughlin (Indiana Geological Survey) and I did field and core study to identify important linkages of depositional sequences and bioevents between the Cincinnati Arch and the Illinois Basin. We summarized this research in pre- and post-meeting field trips for the Geological Society of America Annual Meeting in Indianapolis, Indiana. We hosted fieldtrips and workshops aimed at integrating new data on geochemistry and C isotopes in a series of quarries in northern Indiana as well as new exposures in the Sellersburg-Louisville, KY area; this work is summarized in GSA Guidebook articles (Brett et al., 2018; McLaughlin et al., 2018).

I also worked with Chris Waid of the Ohio Geological Survey to extend Silurian correlations through the subsurface into New York, Ontario and other adjacent regions. Our objectives include regional correlation of Silurian sequences across all parts of Ohio
and bridging into adjacent states in the Appalachian, Michigan, and Illinois Basins and Nashville Dome. We also hope to standardize terminology and make Ohio a key reference area for Silurian studies.

We have also sampled several somewhat controversial intervals for both C isotopes and conodonts, which are being studied in conjunction with Mark Kleffner (Ohio State University Lima). In particular, there is circumstantial evidence that two intervals in the lower part of the Brassfield Formation in Ohio, previously considered to be Lower Silurian, may actually be Hirnantian. My current MS student, Cole Farnam, is investigating this issue using carbon isotopic measurements to test for presence or absence of the strong Hirnantian excursion (HICE).

B) Silurian Sequences and Echinoderm Faunas

Dr. James Thomka (University of Akron, OH) and I are continuing study of the detailed sequence and cycle stratigraphy, taphonomy, paleoeconomy (especially of echinoderms) and paleoenvironments of the early Wenlock interval in Indiana, Kentucky, and Tennessee. We continue work on two manuscripts dealing with Silurian crinoid columnals, using our ability to identify stems to better document biodiversity and biases. We are also documenting traces formed by host-specific parasites that embedded themselves in certain species of crinoids and other pelmatozoans.

C) Volatility in the Silurian-Devonian

I have continued investigating the relative "volatility" (i.e., the degree of environmental and biotic change per unit time) of stage-level time slices in the Ordovician through Devonian. New absolute dates for the stages have led to surprising and counterintuitive results. Pat McLaughlin (Indiana Geological Survey), Poul Emsbo (US Geological Survey, Denver) and I continued to pursue detailed studies that are leading to an important new synthesis that will help to shed light on critical processes in Earth and life history; a first paper was produced on this topic. A first installment on Devonian volatility was published on-line in 2018 (Brett et al., 2018, Palaeo-3).

D) Stratigraphic Nomenclature

As Chair of the North American Commission on Stratigraphic Nomenclature (NACSN), I worked with other member of the commission on developing the category of submembers as a formal subdivision to give a broader hierarchy of stratigraphic units (Formation-Member-Submember-Beds-Bed). I further illustrated the use of this rank in discussing stratigraphy of the Tristates area as the Geological Society of America post-meeting field trip, which was a cooperative effort sponsored by the NACSN, the Ohio Geological Survey and Indiana Geological Survey. We also hosted a poster session on Integrated Biostratigraphy with some 20 presentations, including four involving Silurian issues, at the GSA Annual meeting in Indianapolis. A larger initiative of NACSN is the development of a study group on chemostratigraphy; we intend to discuss the merits of including formal chemostratigraphic units in the North American Stratigraphic Code.

In 2018, I was

1) elected Corresponding Member of the Senckenberg Institute, Frankfurt, Germany;  
2) elected Chair of the North American Commission on Stratigraphic Nomenclature.

Carlton E. Brett  
Department of Geology, University of Cincinnati, Cincinnati, OH 45221-0013, USA
Petr BUDIL (Czech Republic). I had no important investigation made on the Silurian in 2018.

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Carole BURROW (Australia). The paper that Sue Turner and I had in press on a new microvertebrate assemblage from the latest Silurian of Maine, USA has been published (Turner and Burrow 2018). Palaeozoic vertebrates are rare in Maine, and this was the first description of Silurian material; the assemblage showed affinities with those from other circum-Arctic regions. I also collaborated with Russian coworkers on describing acanthodians from the S-D boundary beds of Novaya Zemlya (Burrow et al. 2018). A manuscript on late Silurian vertebrates from the Pendock-1A borehole off Western Australia, which has been in progress for more than two decades (!), has now been published on line (Burrow et al., 2019).

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Mikael CALNER (Sweden). After a six year period as head of the geology department in Lund University, I am now stepping down from that position, meaning possibilities to increase research time. My Silurian focus continues to be carbonate sedimentology and carbonate platform dynamics and its integration with geochemistry and palaeontology. Since the start of 2018, I am co-supervising PhD-student Ingrid Urban (Lund) in a project on oolites including Silurian examples (main supervisor is Sylvain Richoz, Lund). I am continuing my collaboration with Rongchang Wu and NIGPAS on the Silurian events and in 2018 we visited Gotland to see the key sections for further correlation with sections in China. Collaboration with Brad Cramer on the Wenlock Altajme core from Gotland is continuing.

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Yves CANDELA (UK). I have undertaken a revision of Archie Lamont’s 1978 paper on the Telychian fauna from the Pentalnd Hills, near Edinburgh, Scotland. This involved identifying and locating the specimens described (some are unfortunately lost), but also updating the taxonomic identification of the specimens; many are regarded synonyms. This is part of a curatorial project I am undertaking aimed at highlighting the Lamont
Collection bequeathed to the National Museums Scotland in 1985. For those who do not know, Archie Lamont was a Scottish palaeontologist whose earlier work was of decisive importance in the understanding of the NEI fauna and Palaeozoic palaeontology.

This article has been accepted for publication in *Palaeontologia Electronica* and is scheduled for 2019.

I am also still working on faunas from the Telychian rocks from the North Esk Inlier, Pentland Hills.

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**Robin COCKS** (UK). 2018 was a year dominated by work with good friends. However, by myself some time was spent in all the final changes and proof corrections for my large (260 printed pages and 41 plates) Palaeontographical Society Monograph on *The Llandovery Brachiopods of England and Wales*, which will eventually be published in March 2019 – the final result of my doctoral research which started in 1962 but whose scope has much widened since then. In addition a global analysis of Telychian brachiopod genera with Rong Jiayu (Nanjing) was completed and is now in press with *Alcheringa*; a paper on the Lower Ordovician stratigraphy and brachiopods of south-western Wales was completed with Leonid Popov (Cardiff, Wales and Gorgon, Iran) and is now in press with *Proceedings of the Geologists’ Association*, as well as other joint projects. I attended and read a paper at the Brachiopod Congress in Milan, Italy, in September and visited Oslo, Norway, in October to further progress work with Trond Torsvik on Lower Palaeozoic palaeogeography.

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**Carlo CORRADINI (Italy).** The work on Silurian conodonts and biostratigraphy continues. Last year most of the researches were devoted to the Carnic Alps, where I am investigating the Silurian and Lower Devonian *Orthoceras* limestones and calcareous levels within black shales sequences, both studying new sections and updating data from classical localities. A paper on a relatively new section of Pridoli-Lochkovian age was published, and one on conodonts across the Silurian/Devonian boundary in the whole Carnic Alps has been submitted. Researches in the area include also geological and palaeontological investigation (with L. Simonetto, M. Pondrelli, T.J. Suttner and others).

In Sardinia I’m studying calcareous sections (with M.G. Corriga) and black shales outcrops. The study of conodonts from the San Juan Precordillera (Argentina) is in progress (with M.J. Gomez, A. Mestre and S. Heredia), and a paper on the first report of the *P. siluricus* Zone in South America is published (Gomez et al, 2018).

The taxonomic study of Silurian and Lower Devonian conodonts continues together with M.G. Corriga: the new genus *Walliseronathus* is introduced and proposed as possible ancestor of *Pol. siluricus* (Corradini & Corriga, 2018), and the reconstruction of some apparatuses is in progress.

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**Brad CRAMER (USA).** We continue to work on the Silurian of the midcontinent USA as well as the Appalachian Basin in my research group here at Iowa. My former PhD student Neo McAdams is now a tenure-track assistant professor at Texas Tech University and she continues to work on Silurian and other Palaeozoic projects. We recently published a suite of projects from Iowa, New York, and Illinois, the most recent of which is a revision to the stratigraphy of the Bainbridge Group that covers the Wenlock through Pridoli of the US midcontinent. My former students Chris Waid and Erika Danielsen are both working at the Ohio Geological Survey and their MS projects are both now published. Erika’s is currently in press with *Geosphere*. My current PhD student Stephan Oborny is preparing to defend his dissertation this coming summer and has been doing excellent work on the Appalachian Basin. In collaboration with Alyssa Bancroft from the Indiana Geological and Water Survey, we recently submitted a re-examination of the C.T. Helfrich conodont collection from the Appalachian Basin as well. The Silurian Chapter of the GTS2020 is just about finished and Mike Melchin and Pete Sadler have been leading that project to the finish line. Current other work is mainly focused on working on the Altajme Drillcore
from Gotland, Sweden, and the first isotope data are just now coming back from the lab

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Susana DE LA PUENTE (Argentina). I continue to focus on chitinozoan studies. I am a scientific researcher for CONICET of Argentina, and a Professor in the Geology Department at the Universidad Nacional del Comahue in Neuquén, Argentina. My research is concentrated on northwestern Argentina, and also, in recent years, the Patagonia region of Argentina.

Graciela Susana de la Puente
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André DESSROCHERS (Canada). I am working on the Upper Ordovician to Lower Silurian strata of the Anticosti Island in Eastern Canada. My research program focuses on high-resolution stratigraphic studies integrating carbonate sedimentology, sequence stratigraphy, biostratigraphy, and chemostratigraphy. One current M Sc project (Marli Vincent-Couture) is examining nearshore depositional systems in a mixed carbonate-siliciclastic succession at the eastern end of Anticosti Island. A number of collaborative projects are also in progress including i) testing global anoxia an alternative cause for the Hirnantian mass extinction (with Julie De Weirdt and Thijs Vanderbrouke), ii) time-series analyses derived from high-resolution stable isotope data of the Upper Ordovician Anticosti succession (with Matthias Sinnesael and Thijs Vanderbrouke), iii) stratigraphy and timing of the End Ordovician mass extinction (with Joshua Zimmt and Seth Finnegan), iv) sedimentology and paleoecology of Telychian encrinites (with Bill Ausich), v) High Resolution δ13C and δ18O chemostratigraphy across the Ordovician-Silurian Boundary (with Matthew Braun, Alain Mauviel, and Pascale Daoust) and vi) Diagenesis, Ca and Li isotopes at the O/S boundary (with Rachel Wood, Philip Pogge von Strandman, and Will Newton).

Anticosti Island was recently placed on the Canada’s Tentative List for World Heritage Sites on the basis of its outstanding record of fossil life for the upper Ordovician to lower Silurian time interval. This interval represents a milestone event in the history of the Earth, the first global mass extinction of animal life. The local and provincial governments are planning to build an interpretation centre with accommodation facilities available for visiting geoscientists in the near future.

Other on-going research projects include: i) the significance of widespread transgressive oolitic limestone preserved at the basin margin of the Yangtze Platform in South China (with Guangxu Wang and Renbin Zhan) and ii) the multi-order stratigraphic
record of the Lower Cambrian sandstones and limestones in the South Labrador (with Jean-François Ghienne).

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**Annalisa FERRETTI (Italy).** My Silurian research continues to be focused on the biosedimentology and palaeoecology of the Austrian Carnic Alps. A cooperation project (with P. McLaughlin and P. Emsbo) on the study of Silurian ironstones in the US, centered on the comparison with coeval occurrences in the Carnic Alps, is still running. An integrated study on modern iron ooids from Panarea (Sicily) has been submitted and preliminary reported in a series of abstracts.

I am actually co-guest editing with **Alyssa Bancroft** and **John Repetski** a Special Issue of *Palaeogeography, Palaeoclimatology, Palaeoecology* focusing on “GECkO: Global Events impacting COndodont evolution”. The GECkO Issue will seek to take the concept of conodont animals beyond the simple idea that their primary utility is to serve as biostratigraphic markers and geochemical archives and to again begin looking at their temporal complexity and their potential to reflect events that occurred at a global scale. Several Silurian papers are included. Within the GECKO Issue, I have co-authored a paper (**Medici et al.,** in press) that, by the use of X-ray microdiffraction carried out through an X-ray micro-diffractometer, integrated with environmental scanning electron microscopy coupled with chemical microanalyses (ESEM-EDX), investigates conodont element crystal structure throughout the entire stratigraphic range of these organisms. In particular, bioapatite crystallographic cell parameters have been calculated for about one hundred conodont elements ranging from the late Cambrian to the Late Triassic. Resulting data clearly indicate two distinct distribution plots of cell parameters for paraconodonts and euconodonts. In contrast, age, taxonomy, geographic provenance and CAI do not affect the dimension of the bioapatite crystal cells. Conodont bioapatite crystallographic cell parameters have been compared with cell parameters resulting from phosphatic/phosphatized material (ostracodes, brachiopods, bryozoans, and fish teeth) present in the same residues producing conodonts.
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Mansoureh GHOBADI POUR (Iran). I continue my work on various aspects of biostratigraphy, lithostratigraphy, palaeontology and biofacies of the Silurian System of Iran. In present, my major objective is a study of the silicified trilobite fauna from Aeronian of Derenjal Mountains, which is carried out in cooperation with Robert Owens and Leonid Popov. The study of the rich Aeronian brachiopods fauna of Kopet-Dagh is also in progress.

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William B. HARRISON, III (USA). Our group at Western Michigan University continues to work on Silurian units in the Michigan Basin. In 2018 several papers were published relating to that work. Student work that is nearly complete includes:
1) Matthew Rine, Ph.D., Dissertation in final preparation, A New Chronostratigraphic Framework for the Silurian (Wenlockian) Niagara and Salina Units of the Michigan Basin

2) Mohammed Al-Musawi, M.S., Thesis manuscript in preparation, Application of Handheld XRF, Biostratigraphy, and Carbon Isotopes to Establish a Sequence Stratigraphic Framework and Depositional Facies Model for the Burnt Bluff Group, Michigan Basin, USA

3) Zaid Nadhim, M.S., Thesis manuscript in preparation, Controls on reef geometry and internal facies Architecture, Silurian Pinnacle Reefs, Michigan Basin

Besides, the Geological Society of America published Special Paper 531 edited by Grammer, G.M., Harrison, W.B., III, and Barnes, D.A., entitled Paleozoic Stratigraphy and Resources of the Michigan Basin. Seven of the 15 papers in the volume deal with the Silurian of the Michigan Basin.

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Kathleen Histon (Italy). I continue my studies on Silurian cephalopods, sea-level changes, oceanic cycles and biotic response in the Ordovician/Silurian of the Carnic Alps and other localities in relation to the use of the migrational pathways of pelagic faunas as a tool for timing of open seaways and microterrane position along the North Gondwana margin. Investigation of Silurian nautiloid biozones for biostratigraphic correlation is ongoing.

Kathleen Histon (Independent researcher)
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David J. Holloway
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HUANG Bing (China). I continue working on the project led by myself from the National Natural Science Foundation of China which was just finished at the end of 2018. Last year, two studies were finished, one was formally published in Palaeo-3 and the other was accepted by Papers in Palaeontology. The published paper discussed palaeobiogeography and ecology of brachiopods after the end Ordovician mass extinction. The accepted one reported a newly-discovered fauna with abundant Cathaysiaorthis from the lower Zhangwan Formation (lower-middle Rhuddanian, lower Llandovery) in Qinling, central China. This fauna is slightly younger than that previously documented from Southeast China which was published as a monograph. My international collaboration with Prof. David Harper was fruitful in 2018, we wrote two manuscripts together (one was accepted and the revision of the other has been submitted). Besides the studies above, I also coauthored two papers with Prof. Rong Jiayu. One is about Hirnantia brachiopod faunas from Sibumasu terrane (the revision has been submitted), the other is review on the Silurian stratigraphy of China (published). This year, I attended two congress, 5 IPC and 8 IBC (international brachiopod congress), and made oral presentations for both congresses. With my help, my MSc student Zhou Hang-hang also gave an oral presentation for the 8 IBC. To ensure that he could get master degree next year, I also did my best to help him on his study and thesis which deals with a recovery brachiopod fauna after the end Ordovician mass extinction. Now, he has already finished systematic palaeontology and community analysis.

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Jisuo Jin  
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Markes JOHNSON (USA). Progress continues to be made with regard to Paleozoic hurricane studies. As a follow-up to fieldwork with Johan Fredric Bockelie for several years prior to his death in 2016, a new paper looking at the influence of hurricane tracks was published on the Upper Ordovician / Lower Silurian of the Oslo area in 2018. At the end of 2018, the first draft of a book-length manuscript was completed under the provisional title "Islands in Deep Time: Lost and Found." Five chapters out of 12 cover paleoislands from the Cambrian, Ordovician, Silurian, Devonian, and Permian with an emphasis on global marine circulation patterns and storm deposits (among other things). The book is currently under review with a major university press in the US.

Markes E. Johnson  
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Dimitri KALJO (Estonia). I continued some studies (see below) on the Ordovician and Silurian bio- and chemostratigraphy of Baltica as an emeritus member at the institute and as the editor-in-chief of the Estonian Journal of Earth Sciences. Beginning with March 2019 I will step down from the latter commitment etc.

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Steve KERSHAW (UK). Steve Kershaw is making a comprehensive study of British Silurian stromatoporoids, using samples from the field and museum collections to assemble the first overall study of Silurian stromatoporoids since the time of Nicholson in the late 19th Century. The work aims to update the taxonomy, palaeontological and palaeoecological knowledge within the framework of current stratigraphy, palaeogeography and palaeoenvironmental reconstructions.

The world will be grateful for any new work on Silurian stromatoporoids and corals! There is a lot of valuable palaeobiological and palaeoecological information in these fossils. For stromatoporoids the 2015 Treatise volume, that revises the taxonomy
extensively, makes the taxonomic study a lot more accessible nowadays, and I am always happy to help identify species.

**Stephen Kershaw (Ph.D.)**
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**Tarmo Kiipli (Senior scientist)**
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**Anna KOZŁOWSKA (Poland).** I have been continuing my research on evolution, phylogeny and construction of tubaria of the retiolitids based on isolated material from Poland, Baltica. I am focussed in the post- *lundgreni* event period. Actually, I have been working on the adaptation to the plankton style of life of the new retiolitid forms with unusual, large, extended genicular structures. Together with Alf Lenz and Mike Melchin I have continued project about the tubaria membranes in retiolitids based on the best, isolated material from the Arctic Canada and Poland. Work continues with Denis Bates on the retiolitid genus *Paraplectograptus*.

**Anna Kozłowska**
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**Petr KRAFT (Czech Republic).** I have just finished the second exclusive excursion to the world of the Silurian plants, and the work has just been published in *Palaeo*–3 (see the reference list).

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Alfred Lenz (Canada). I have been retired for a long time, but still try to keep my hand-in with a minimum of research. I have referenced four research papers on Silurian graptolites during the last two years, and participated in writing several chapters of the graptolite Treatise, the last for the Retiolitids. This is entitled “Part V, Second Revision, Chapter 26, Family Retiolitidae: Introduction, Morphology, and Systematic Descriptions”, by Alfred C. Lenz, Denis E.B. Bates, Anna Kozłowska, and Jörg Maletz. I have a research project, studying retiolitine development, and collaborating with Anna Kozłowska, and Michael Melchin.

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Li Qijian (China). I am mainly working on the sedimentology and palaeoecology of Ordovician and Silurian reefs. In 2018, I continued work on some Lower Telychian bryozoan reefs which were probably influenced by internal waves in the South China Block. In collaboration with Prof. Axel Munnecke and Dr Stephen Kershaw, I am now working on some Aeronian coral-stromatoporoid reefs of the South China, targeting reef recovery patterns after the Hirnantian mass extinction. And I also continue my collaborations focused on quantitative paleoecological analyses of reefs at the Ordovician-Silurian transition with several colleagues.

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Liang Yan
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Steve LoDUCA (USA). I continue to work on Early Palaeozoic macroalgae, including taxa from the Silurian. Current studies are focused on macroalgae from the Bertie Group (NY) and similar forms, and the effects of the end Ordovician mass extinction event on macroalgae.

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Jason Loxton (Ph.D.)  
Math Physics & Geology, School of Science & Technology, Cape Breton University, P.O. Box 5300, 1250 Grand Lake Rd., Sydney, Nova Scotia, Canada B1P 6L2

David LOYDELL (UK). I am currently working a wide variety of projects, some largely graptolitic, others combining biostratigraphy with carbon isotope and other geochemical data. Integrating the graptolite biostratigraphy of the Sommerodde-1 core Bornholm with geochemical data (with Emma Hammarlund, Niels Schovsbo, Arne Nielsen and Donald Canfield) is proving very interesting – results will hopefully be published this year.

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LUAN Xiaocong (China). I am interested in Ordovician and Silurian sedimentology and stratigraphy, especially the environmental background of bioevents, i.e., the Great Ordovician Biodiversification Event and the end-Ordovician mass extinction. Ongoing studies include Early-Middle Ordovician marine red beds and special ferric oncotic deposits in South China. I am a member of the Lower Palaeozoic Working Group of Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences.

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Peep MÄNNIK (Estonia). I continue to work on evolution, taxonomy and palaeoecology of conodonts, conodont-based high-resolution stratigraphy, bioevents and palaeogeography. I am also interested in sequence stratigraphy, palaeoclimatology and evolution of sedimentary basins. Joint studies together with colleagues from Estonia, Czech Republic, Germany, Poland, Iran, Japan, Russia, Sweden, U.K. and USA on evolution and high-resolution stratigraphy of the Early Palaeozoic faunas and sedimentary basins on different palaeocontinents are going on.

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Alexander (Sandy) McCracken (Canada). I am periodically working on good Ordovician-Silurian collections from Hudson Bay and Moose River basins, Ontario and Manitoba. I retired in September 2017, and am a part-time volunteer with the GSC Calgary office. I work at my Victoria home (not in the GSC Sydney office), having moved my microscope and samples with me. I am in e-mail contact with the Calgary office weekly, and so may be a bit slow to respond to e-mails.

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**Michael MELCHIN (Canada).** I am 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, collaborating with Charles Mitchell, Chris Holmden, Peter Sadler, Brad Cramer, Junxuan Fan, and others. I am collaborating with Petr Štorch, Junxuan Fan, Xu Chen, Jan Zalasiewicz, Thijs Vandenbroucke and others on the study of potential GSSP candidate sections for the base of the Aeronian Stage in Wales and China, and with Junxuan Fan and Xu Chen on a GSSP candidate section for the base of the Telychian in China. I am collaborating with Erik Sperling, Justin Strauss, and Tiffani Fraser on Ordovician to Lower Devonian graptolite biostratigraphy and chemostratigraphy in northern Yukon. I am also working with Petr Štorch and others on several projects related to morphologic and phylogenetic analyses of early Silurian graptolites.

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**Tatiana MODZALEVSKAYA (Russia).** I am working on Silurian brachiopods from South Verkhoyanie (mountain ridge Sette-Daban). An addition, I continue to take part in thematic projects connected with analysis of Regional scales of Eurasian Russian regions. The new project: Atlas of compilation on the Phanerozoic stratigraphical key sections of Arctic Russia will be start this year. In the network of this project I describe Silurian sections of Polar Urals, Siberia and North-East Russia with lithologic and biostratigraphic analyzing.

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Axel MUNNEKE (Germany). My ongoing Silurian-related research is related to two different projects. In one project we are investigating the response of bryozoan communities to the Silurian climatic changes. The other project deals with so far undiscovered occurrences of Silurian evaporitic minerals in shallow carbonate platform settings.

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John PEEL (Sweden). Although I continue to focus on Cambrian faunas from Greenland, I have several studies of Silurian gastropods in progress. Two papers were published in 2018 and a third concerning pycnomphalids is in progress. The material in question is derived from the ower Silurian carbonate mounds of the Washington Land Group of North Greenland, exposed at around 81 to 82 degrees North., near the shore of the Arctic Ocean.

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Ian PERCIVAL (Australia). I officially retired in mid-2018, and is now an Honorary
Research Associate of the Geological Survey of NSW. Theoretically I now have more time to devote to completing several long-delayed manuscripts, but in actuality many hours are being spent on editing the *Australasian Palaeontological Memoirs* series for the Australasian Palaeontologists group. Memoir 51, including papers from the PDU2 Symposium held in Adelaide in mid-2016, was published in December. This volume contains a paper (with Des Strusz) on Silurian brachiopods from Quidong in southern New South Wales. Two other manuscripts on Silurian faunas from central NSW are planned for submission in 2019.

I continue a productive collaboration with Guangxu Wang and colleagues from the Nanjing Institute of Geology and Palaeontology, focussing on the Hirnantian extinction, recovery and stratigraphy of the Ordovician – earliest Silurian interval in China.

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*Leonid POPOV (UK).* I have slow, but steady progress in work on the Silurian brachiopods of Nuratau and Turkestan ranges, Central Asia in cooperation with Irina Kim (Geological Survey of Uzbekistan), and on the late Silurian brachiopods from Derenjal Mountains, Iran in cooperation with Mansoureh Ghabadi Pour and Vachik Hairapetian.

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Sigitas RADZEVIIČIUS (Lithuania). I am working on Silurian graptolites from Lithuania and the Holy Cross Mountains. In addition, I am working on several projects: 1) Upper Homerian lundgreni extinction; 2) the Ludlow graptolites biostratigraphy and biodiversity; 3) the phylogeny of the Wenlock and Ludlow monograptids; 4) partly on the Silurian cyclostratigraphy.

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David RAY (UK). My research activities over the past year have focused upon the Wenlock Series of the Midland Platform (England and Wales). In particular, collaboration with Emilia Jarochowska and others has focused upon details of sedimentology, sequence stratigraphy and the Homerian carbon isotope excursion within the Malvern and Dudley areas. Ongoing collaboration with Helen Hughes, Emilia Jarochowska, Anna Claussen and others is focused on the Dolyhir and Nash Scar limestones (Powys) and relates to the early Sheinwoodian carbon isotope excursion, sedimentology, sequence stratigraphy and faunas (trilobites, conodonts and bryozoans). In addition, ongoing collaboration with Helen Hughes and Alan Thomas is focused upon the trilobite record from the Lower Hill Farm Borehole (Wenlock Edge). Finally, fieldwork is underway within the Usk inlier (Monmouthshire). These projects aim to further refine regional stratigraphy.

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RONG Jiayu (China). In 2018, I completed a manuscript dealing with the Hirnantia fauna from a new locality of the Mandalay Region, Myanmar and submitted it to Palaeoworld. The paper is now formally accepted after revision. Meanwhile, Chen Di and I finished a manuscript establishing a new genus Xenocrania of the craniid brachiopods from the Hirnantia fauna of South China and Myanmar that has been just published in Papers in Palaeontology recently.

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Valeri SACHANSKI (Bulgaria). Since 2013, I continue to teach students at the University of Mining and Geology “St. Ivan Rilski”, Sofia, Bulgaria. Teaching takes most of my time. I am working on Ordovician–Devonian stratigraphy of Bulgaria and Turkey and especially on Silurian–Lower Devonian graptolite biostratigraphy.

Valeri Sachanski
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Paul SELDEN (USA). I did not publish or do any work in the Silurian last year. Most things I am involved with the beginning with ‘C’: Cambrian, Carboniferous, Cretaceous.

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Andrew SIMPSON (Australia). I am currently engaged in research on Silurian conodont faunas from the Broken River in north Queensland and Boree Creek NSW Australia. And I spent time in both areas during 2018 with colleagues undertaking detailed sampling through recognised Silurian extinction events. Collaborative work with former Macquarie University colleagues, John Talent, Ruth Mawson and David Mathieson continues.

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Andrej Spiridonov (Lithuania). Together with Misha Whittingham and Sigitas Radzevičius working on the stratocladistics, disparity and completeness of the fossil record of late Wenlock to Ludlow pristiograptine graptolites. With Robertas Stankevič working on the development of the paradigm of generalized quantitative integrated stratigraphy. Completing the work on the Pridoli conodont palaeoecological dynamics in the Baltic Basin.

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Colin Sproat (Canada). I have taken up a new position as an assistant professor at the University of Saskatchewan following my postdoctoral fellowship in Nanjing, China (note new contact information below). Work will continue on the previously unpublished Late Ordovician brachiopods of the Tarim Basin in northwestern China and their evolutionary and palaeobiogeographical significance in collaboration with Renbin Zhan, but now back in Canada, I am looking forward to returning to my research on the Ordovician and Silurian brachiopods of North America. I am particularly interested in evolutionary trends in terms of time and space.

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**Petr ŠTORCH (Czech Republic).** My efforts were largely focused on re-evaluation and presumed replacement of the Aeronian GSSP. Multidisciplinary, multi-authored study of the Hlásná Třebaň section – a candidate for GSSP of the Aeronian Stage – was published in 2018 in *Lethaia*. I and Mike Melchin completed systematic revision of the zonal index graptolite *Demirastrites triangulatus* – proposed base-Aeronian marker species – and related early Aeronian demirastritids during my James Chair visiting professorship at St. Francis Xavier University in Antigonish in summer 2018. It has been published in *Bulletin of Geosciences*. Together with Sun Zongyuan from NIGPAS, a detailed comparative study has been performed on early and middle Aeronian rastritids with a view to test presumed cosmopolitan distribution of selected biostratigraphically important taxa.

Further progress was made in the multi-proxy study of a continuous Homerian succession exposed in Kosov Quarry with respect to ongoing revision of the Homerian GSSP. Systematic bed-by-bed study of the middle and upper Homerian section revealed detailed anatomy of the mid-Homerian biotic crisis (*Lundgreni Event*) including subsequent faunal recovery. New manuscript “The mid-Homerian (Silurian) biotic crisis in offshore settings of the Prague Synform, Czech Republic: integration of the graptolite fossil record with conodonts, shelly fauna and carbon isotope data” co-authored with Š. Manda, J. Frýda, L. Slavík and Z. Tasáryová has been recently submitted for publication in *Palaeogeography, Palaeoclimatology, Palaeoecology*.

I have been also working on graptolite-rich Ordovician-Silurian boundary succession of Spanish Pyrenees in collaboration with J. Roqué-Bernal and J. C. Gutiérrez-Marco. Our paper entitled “A graptolite-rich Ordovician–Silurian boundary section in the south-central Pyrenees, Spain” has been published online in *Geological Magazine*.

Since 2017 I am involved in a project focused on potential chronostratigraphic subdivision of Pridolí Series. The project coordinated by L. Slavík is funded by Czech Science Foundation.

Last but not least, I was engaged in recent research by M. Libertín et al. on the oldest known poly-sporangiate land plants recovered from middle Sheinwoodian marine succession adjacent to ancient Svatý Jan Volcanic Island, Prague Synform, Czech Republic.

In the next couple of years, before I get retired, I intend to make a synthesis on Silurian graptolite biostratigraphy and faunal dynamics based upon my life-long studies on graptolite bearing Silurian succession of the Czech Republic.

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**Christopher STOCKER (UK).** I am continuing to research the Silurian and Devonian trilobites of Japan, as part of a Leverhulme Trust funded international project led by Mark Williams (University of Leicester, UK). European colleagues include David Siveter and Carys Bennett of the University of Leicester, Derek Siveter of the Oxford University Museum of Natural History, Phil Lane of Keele University, Thijs Vandenbroucke of Ghent University, and Peep Maanik and Olle Hints of Tallinn University of Technology; colleagues in Japan include Simon Wallis from Tokyo University, Tatsuo Oji of Nagoya
University Museum, Gengo Tanaka of Kanazawa University, Toshifumi Komatsu and Takumi Maekawa of Kumamoto University and Yukiyasu Tsutsumi of the National Museum of Nature and Science, Ibaraki. Palaeontological research has focused on ostracods, chitinozoans, conodonts, scolecodonts and trilobites.

My PhD research to date has provided a detailed analysis of the biogeographical affinities of six groups of Japanese trilobites (Illaenidae, Scutelluidae, Phacopidae, Proetida, Aulacopleurida and Encrinuridae). This includes an update of their taxonomic assignments, establishes a working biostratigraphy across Japan for strata of Silurian and Devonian age, and examines links with the faunas of South and North China, and those of Australia. I have studied the geographical, lithological, and palaeoecological controls on the distribution patterns of these Japanese trilobites. Extensive museum collections from throughout Japan have been studied, supplemented with targeted fieldwork collecting in northeastern and central Honshu and Kyushu. Future work will include an analysis of other Japanese trilobite groups including Calymenida, Cheirurida and Lichida. The results of my research have been published in a special issue of Island Arc entitled ‘The Palaeozoic evolution of the Korean Peninsula and Japan’ with guest editors Simon Wallis, Tatsuo Oji, Mark Williams and Moonsup Cho.

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Paul STROTHER (USA). I am interested in non-marine palynology and especially the fossil record of cryptospores and related algal spores and plant-like debris from the Silurian. Right now, I am associated with a project at the University of Sheffield that is exploring the fossil record of the euglenids, beginning with the acritarch, *Moyeria*. We have re-collected from the holotype locality near Illion New York and will be working on *Moyeria* and other freshwater algal microfossils associated with ponded habitats. Wilson Taylor (University of Wisconsin - Eau Claire) has shown through TEM of the wall ultrastructure that *Moyeria* is indeed a euglenid, confirming a proposal made by Gray & Boucot in 1989. We will be expanding work on other possibly fossil euglenids in the next year or so.

I have set up a website at "www.cryptospores.com" that will be building a resource on cryptospores, including posting images of type and paratype material. It's a work in progress, but does currently include a basic set of images related to Silurian and older cryptospores.

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Desmond STRUSZ (Australia). The study with Ian Percival of the Wenlock brachiopod fauna from the Quidong area near Delegate in southern New South Wales was published at
the end of 2018. I will now start tying up some loose ends, looking to see if there are any new taxa in the extensive Geoscience Australia collections from the Canberra Formation, and also having another look at a few residuals from my doctoral thesis on the Lower Devonian Garra Limestone in central-west New South Wales. I have also helped Ross McLean check through my Garra material [now held by the New South Wales Geological Survey at the W.B. Clarke Centre in Londonderry, western Sydney] for a variety of unpublished coral taxa worth revisiting.

While now working entirely from home, I continue to hold a Research Associate position with the Australian Museum in Sydney, and am still affiliated with the Australian National University in Canberra, as a member of the Emeritus Faculty.

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John TALENT (Australia). I report that Macquarie University (Sydney) conodont and brachiopod workers are persevering with research on Silurian sequences in eastern Australia, continuing on from studies (published and unpublished) by the late Peter Molloy (Boree Creek, Ireviken Event conodonts), John Talent and Andrew Simpson (Lau Event conodonts following earlier studies with the late Lennart Jeppsson et al.), Margaret Harvey (Klonk Event silicified brachiopod faunas following on from published conodont work by John Farrell) and stable isotopes by Jiri Fryda (all three events). Sequences through the Klonk Event in northern Queensland (all in the watershed of the Broken River and tributaries) and New South Wales (Yarrangobilly) have been sampled for conodonts and stable isotopes.

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TANG Peng (China). A new project “Chitinozoans and comprehensive study on Late Ordovician-Early Silurian Strata in the Western Yangtze Region, China”, which is sponsored by the National Natural Foundation of China, began execution in 2018. Much work on chitinozoans, graptolites and isotope analysis with be carried out in the next four years in the Western Yangtze Region. In addition, more than 400 samples from Lower Silurian strata were sampled from three boreholes in the Lower Yangtze Region. These samples will be processed for chitinozoans and acritarchs in 2019.
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Susan TURNER (Australia). I am still working on mid-Palaeozoic vertebrates and their biostratigraphy, concentrating on thelodonts and ‘sharks’. Various projects continue on the ORS fishes of Britain (Welsh Borders, S Wales, Midland Valley Scotland and Ireland), Pennsylvania, USA and arctic Canada, and across Gondwana (Australia, China, Morocco, Pakistan).

Sue is co-author on publications about thelodonts and stem chondrichthyans (with Carole Burrow and others) in the AGP volume based on presentations at the Early Vertebrates/Lower Vertebrates conference in Poland in 2017, a symposium that was held in honour of Sue’s 50 years of work. Several papers recently published (Turner & Burrow 2018) and in progress deal with biostratigraphy and correlation of Australian and other vertebrate microremain occurrences from assemblages previously unstudied or only superficially studied, with better known sequences in other regions.

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Thijs VANDENBROUCKE (Belgium). I remain interested in reconstructing the Silurian palaeoclimate and palaeo-environment. Julie De Weirdt continues her PhD research
project with me at UGent, focussing on geochemistry and palynology of the Upper Ordovician - lower Silurian in N. America (in collaboration with Poul Emsbo, USGS, Patrick McLaughlin, Indiana Geol. Survey and André Desrochers, UOttawa). Julie’s first paper on the chitinozoan biostratigraphy from the Rheidol Gorge in Wales is now accepted, and will be of interest to those amongst you involved in the ongoing discussions on the new Aeronian GSSP. I also continue to co-supervise Matthias Sinnesael, who works on a PhD project with Philippe Claeyss at the VUB (Belgium) on astronomical forcing during the Ordovician and Silurian. MSc student Thomas De Potter is involved in the BGS remapping of the Silurian strata around Knighton (UK). With an international team coordinated by Mark Williams (University of Leicester, UK) and funded by the Leverhulme Trust, we have been re-investigating the early Palaeozoic strata of Japan, and our results are now published in a special issue of Island Arc.

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**Jacques VERNIERS (Belgium).** I am still partly active at the Ghent University, working on a summary article on Ordovician and Silurian lithostratigraphic units of Belgium, where we will include unpublished results of the Chitinozoa research by Jan Mortier (PhD, 2014) and Jan Vanmeirhaeghe (PhD, 2006) and some other MSc students.

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**Olev VINN (Estonia).** I am working on the evolution of symbiosis, predation, bioerosion and biofouling in the Silurian. My current research interests include trace fossils of the Silurian of Estonia and beyond. I am also working on the palaeontology of problematic calcareous tubeworms from the Palaeozoic (e.g. cornulitids, tentaculitids, microconchids etc.) and evolution of tubeworm biomineralization.

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**WANG Chuanshang (China).** I am working on the shale gas in western Hubei Province in 2018. A restudy concerning the subdivision and correlation of graptolite zones of the uppermost Ordovician to lower Llandovery black shale was carried out by my group. We
collected a large amount of specimens from YD-1 drill core and from classical sections in western Hubei Province, China. A relevant article "Katian (Ordovician) to Aeronian (Silurian, Llandovery) graptolite biostratigraphy of the YD-1 DRILL CORE, Yuanan County, Hubei Province, China” by Jörg Maletz, Wang Chuanshang and Wang Xiaofeng has been published in Palaeontology. We will continue to study the graptolite fossils from western Hubei Province in 2019 for a better understanding the time-spatial distribution of the black shale during the Ordovician-Silurian transitional period in western Hubei Province.

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WANG Guangxu (China). In 2018, I continued working on the end-Ordovician mass extinction event. A paper on a refined litho- and biostratigraphy of Hirnantian near-shore carbonate rocks in South China has been published in Geological Journal. Besides, I also made a systematic revision of a Silurian amplexoid rugose coral Pillophyllia Ge and Yu, 1974, resulting in an introduction of a new genus Neopilophyllia. The results have been published in Journal of Paleontology. Currently, I am working on a global review of benthic faunas across the Ordovician and Silurian transition in collaboration with Renbin Zhan (NIGPAS) and Ian Percival (Geological Survey of NSW). In this review, we recognize three Transitional Benthic Faunas (TBFs 1–3) through the Ordovician-Silurian boundary, which contributes to an integrated, much higher-resolution timescale for understanding the tempo and nature of this mass extinction.

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WANG Wenhu (China). Most of my research activities in 2018 have been involved in Ordovician-Silurian boundary projects. Samples from Himalaya area were collected by Paul Myrow (India) for the palynology (chitinozoans and acritarchs) study by Thomas Servais (France) and me. Primary results of chitinozoans show that the samples represent an age around the latest Ordovician to the earliest Silurian. Also, an integrated study on both graptolites and chitinozoans from South China show that the distribution of both chitinozoans and graptolites are eco-dependent but show different onshore–offshore diversity trends. Chitinozoans are more diverse nearer to shore whereas graptolites are more diverse offshore, preferring slope facies (see the article in the reference list). In the
past few months, I am working on the ultrastructures of carinae with Liang Yan (China) and Olle Hints and Jaak Nõlvak from Estonia.

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**WANG Xiaofeng (China).** In 2018, I spent most of my time on two projects, besides the study on the subdivision of Cambrian-Ordovician boundary of the Xiaoyangqiao section, Dayangcha, North China and its precise comparison with the Green Point GSSP section, Newfoundland, Canada on the basis of studying accumulation over the past more than 30 years and high-resolution integrated research over the recent 4 years, as well as a serious deficiencies exposed by the Newfoundland GSSP section over the past 10 years.

First, organizing nearly all palaeontological workers in Hubei Province, China, separately from the China University of Geosciences (Wuhan), the Hubei Academy of Geological Sciences and the Wuhan Center for China Geological Survey (formerly Yichang Institute of Geology and Mineral Resources), to complete three monographs on palaeontological fossils, i.e. “Palaeontology in Hubei”, ”Precise and rare palaeontological community in Hubei” and “Hubei fossils”. These three monographs will be published by Hubei Science and Technology Press in June or July, 2019. The first two, are applicable tertiary education, institutes and related geological departments. The last one characterized by pictures and photos with a few explanation, intended to meet the needs of relevant management departments and the popularization of knowledge of palaeontological science and culture.

Second, we extended a re-study concerning the subdivision and correlation of graptolite zones of the uppermost Ordovician to lower Llandovery black shale bearing shale gas between the underground and ground in western Hubei Province, China under Dr. Wang Chuanshang (graptolitist), together with Jorg Maletz. A relevant articles "Katian (Ordovician) to Aeronian (Silurian, Llandovery) graptolite biostratigraphy of the YD-1 DRILL CORE, Yuanan County, Hubei Province, China by Jorg Maletz, Wang Chuanshan and Wang Xiaofeng will soon be published in the Palaeontology.

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**James WILKINSON (UK).** Coming to an end on my thesis “Ludlow Graptolites of the Welsh Basin” with the imminent publication of a Graptolite Monograph for the area and a
discussion paper on the closing of the Welsh Basin.

The Atlas of Graptolite Type Specimens is a multi-authored publication that supplies clear, large scale illustrations of the holotypes, lectotypes, syntypes and neotypes of described graptolite species. The aim is to make each of the several contributors’ first-hand knowledge of specimens available to other graptolite workers worldwide. Each figure is either drawn from the primary type specimen (or specimens) and is presented at a standard magnification (for example x10 or x5) or is a digitally edited SEM image where finer detail is preferable. The drawings are annotated with essential measurements, such as stipe width (w). Thecal spacings are generally given as the “two thecae repeat distance “(2TRD), after Howe, Geological Magazine, vol. 120, pp. 635-8. In some cases, the equivalent number of thecae per cm follows in brackets. The associated text is brief, but includes comments on the preservation, the repository of each specimen and its registration number, together with the original citation and one or two key subsequent references. The Atlas is to be issued in folios of 100 species, and is supplied loose-leaf, allowing the user to arrange the contributions alphabetically or taxonomically, according to taste. A cumulative index is supplied in this and subsequent folios. The Atlas is an international co-operative enterprise and will be published occasionally, namely when material for 100 species has been received and edited. The editors invite contributions from workers worldwide. Material should be prepared in the style of the present contributions and may be submitted electronically.

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YUAN Wenwei (China). I did field work in Chongqin District in October 2018, visiting some Ordovician and Silurian sections, and collecting Silurian trilobites at several localities. Now I am working on Telychian trilobites from Ningqiang with Zhou Zhiqiang (Xi’an) and Zhou Zhiyi (Nanjing).

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ZHAN Renbin (China). In 2018, together with some of my colleagues both from China and Australia, I was mainly working on the recovery benthic shelly faunas (brachiopods and corals) after the end-Ordovician mass extinction near the beginning of Silurian. We found that the formerly recognized Hirnantia fauna in South China and the world could be further differentiated into three different faunas, i.e. the Transitional Benthic Fauna (TBF) 1-3. And only TBF 1 represents the typical cool water Hirnantia fauna, while the TBFs 2 and 3 represent typical warm water faunas. So, the end-Ordovician mass extinction might be a single pulse event rather than two pulses as previously thought. The paper has already been published by Earth-Science Reviews (Wang, Zhan and Percival, 2019).

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ZHANG Yuandong (China). I am continuously working on: (1) Geological characteristics of Palaeozoic black shales in China. This has been the main tasks of a project supported by the Chinese Academy of Sciences (2014-2018) and one of the recently launched National Science and Technology Major Projects (2017-2019). As results of the projects, over 5000 m long of drill cores of the most potential gas shale in China (Lower Cambrian, Upper Katian–Llandovery) have been accumulated in the past years for multi-disciplinary analysis. The cores are opened to global scientists for study and sampling, and from which some samples have been collected for geochemical and microfacies analysis. Those who are interested in this work or aim at some other related approaches, please contact the project leader (Zhang Yuandong). (2) Hirnantian Conservat-Lagerstätte in Anji (Anji Fauna), Zhejiang Province, in cooperation with Joe Botting and Lucy Muir of UK, financially supported by President’s International Fellowship Initiatives (PIFI) program and a recently approved NSFC grant (2018-2021). This sponge-dominated lagerstätte, discovered in late 2012, is typified by the abundant and highly diverse articulate sponges (over 75 species) often with soft tissues, in association of graptolites, nautiloids, arthropods, echinoderms, etc. The Anji Fauna is preserved within a 9-meter-thick black shale, underlain and overlain by siltstone and sandstones, in the Wenchang Formation of clastic facies. Up to date, over 5000 specimens have been collected from seven sections in the Anji County. As constrained by the associated graptolites, the fauna is of latest Hirnantian age. A preliminary study indicates that this extraordinarily diverse, sponge-dominated community thrived immediately after the Hirnantian mass extinction in South China.

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ZHAI Wenjin (China). Most of my research in 2018 was still related to the Siluro-Devonian vertebrate palaeontology, and relative stratigraphy. The main achievements can be represented by the discovery of the galeaspids *Platylomaspis serratus* from the Silurian Tataerg Formation in Xinjiang and *Nanningaspis zengi* from the Devonian Nakaoling Formation in Guangxi, and the subdivision and correlation of the Silurian fish-bearing strata in South China.

In addition, I conducted the field works both in Yunnan and Hunan in South China during August 2 to September 10 in 2018, supported by the Special Grant for Fossil Excavation and Preparation of the Chinese Academy of Sciences, the National Natural Science Foundation of China and the Strategic Priority Research Program of Chinese Academy of Sciences. Lots of new important and interesting fossil fishes have been collected from Silurian and Lower Devonian during the excursions, and we made some new progress on the Siluro-Devonian stratigraphic division and correlation in South China.

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ZHEN Yongyi (Australia). I am working on the Silurian and Devonian conodonts from New South Wales and their biostratigraphy, while still maintaining the major interests in the Ordovician. In 2018 I documented late Silurian conodont and coral faunas from the Cuga Burga Volcanics in central-western New South Wales. I am currently working with John Pickett, Ian Percival and other colleagues to document the conodont and coral faunas from the late Silurian Molong Limestone of NSW.

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RECENT PUBLICATIONS ON THE SILURIAN RESEARCH

[Note that a few publications are of 2017 or even earlier that were not included in previous Silurian Times, and some papers are dealing with Ordovician topics by members of ISSS. There are also a few papers in the list that are in press or online publication.]


Barnes, C.R. *In press*. Impacts of climate-ocean-tectonic changes on Lower Paleozoic conodont evolution and ecologic organization evidenced by the Canadian part of Laurentia. Palaeogeography, Palaeoclimatology, Palaeoecology, Special Issue (Ferretti, A., Bancroft, A. and Repetski, J., eds.).


sponge from the Silurian of the Pentland Hills (Scotland) with similarities to extant rossellids. Earth and Environmental Science transactions of the Royal Society of Edinburgh.


Burrow, C.J. and Turner, S. 2018. Stem chondrichthyan microfossils from the Lower Old


Cocks L.R.M. and Rong Jiayu. in press. A global analysis of distribution and endemism within late Llandovery (Telychian) brachiopods. Alcheringa.


Di Bella, M., Italiano, F., Sabatino, G., Quartieri, S., Ferretti, A., Cavalazzi, B., Barbieri, R.,


Leone, M.F. and Benedetto, J.L. 2019. The brachiopod Dalmanella testudinaria (Dalman, 1828) across the end-Ordovician extinction event in the Cuyania terrane of western Argentina. Ameghiniana, in press.

Hangzhou, Zhejiang University Press. 69–72.


1. List of all Silurian workers and interested colleagues (updated March 2019)

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2. Brief introduction of new Silurian workers

Mohammed AL-MUSAWI (USA)

Date of Birth: Nov. 06, 1990.

Affiliation: Department of Geosciences, Western Michigan University

Education: B.S. in geology, University of Baghdad.

M.S. in geology, Western Michigan University.

Starting Ph.D. in Fall 2019, Western Michigan University.

Research Interests: Right now I am working in redefining the stratigraphy of the Llandovery section in the Michigan Basin by using an integrated data set includes carbon isotope, strontium isotope, and conodont data.

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LUAN Xiaocong (China)  

**Date of Birth:** June 18, 1990  

**Affiliation:** Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, Nanjing, China  

**Education:** PhD (University of Chinese Academy of Sciences, China)  

**Present position:** Research Assistant, Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences  

**Research interests:** Carbonate sedimentology; sedimentary geochemistry; environmental background of Ordovician and Silurian bioevents.  

**Information to share:** I am interested in Ordovician and Silurian sedimentology and stratigraphy, especially the environmental background of bioevents. Ongoing studies include Early-Middle Ordovician marine red beds and special ferric oncolitic deposits in South China. I am part of Lower Paleozoic Working Team of Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences.  

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Simona RINKEVIČIŪTĖ (Lithuania)  

**Research interest:** Simona is finishing her MSc thesis on the upper Wenlock ostracodes and will continue to do her Ph.D. on the palaeoecology, systematics, and morphometry of Silurian ostracodes.  

**Contact:**  
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Robertas STANKEVIČ (Lithuania)

**Date of birth:** 1988

**Education:** Bachelor (2017) in Bioinformatics from the Vilnius University, Lithuania

**Present position:** Student of classical Geology master degree at the Vilnius University

**Research interests:** Robertas works on the development of recurrence plot techniques for the correlation of Silurian geological sections, and characterization of abundance and diversity dynamics. He will start this year his Ph.D. project on the development of dynamical systems approaches in describing Silurian benthic communities. His major research interests are:

1) Interested in series correlation (synchronization) and cross-recurrence plots.
2) Working on the correlation of Silurian microfossil abundance series of different wells.

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**************************************************************************
Condolence to Dr. Joanne Kluessendorf

April 8, 1949 to June 1, 2018

by Don Mikulic (USA)

Dr. Joanne Kluessendorf passed away on June 1, 2018 after a long illness. Born and raised in Milwaukee, Wisconsin, U.S.A. she received her Ph.D. in geology at the University of Illinois. Joanne had a long career which included associations of some of the most prominent Silurian workers in the country including Robert Shrock, Heinz Lowenstam, Bill Berry, and Art Boucot. Her university classwork started with Katherine Greacen Nelson at the University of Wisconsin at Milwaukee where she also worked in its Greene Museum as a curator. She later took classes from Art Boucot at Oregon State University in Corvallis, Oregon where she was employed for many years as his assistant. Her research interests focused on Silurian carbonate deposition, reef development, and ichnology among other related topics and also took classes on these subjects from Albert Carozzi at the University of Illinois. Joanne was author or coauthor of many Silurian related research papers, including some in conjunction with David Loydell and his students at the University of Portsmouth and provided important information to Lennart Jeppsson when he was developing his Oceanic Episodes and Events model. She led many Silurian related field trips to the Thornton Reef near Chicago including the 1996 Hall Symposium post meeting field trip, was co-discoverer of the Waukesha Biota and was co-discoverer of the Brussels Hill impact site in the Silurian rocks of Wisconsin. A noted expert on the Silurian geology and paleontology of the central U.S. she also conducted research projects in the U. K. and on Gotland. Joanne was a scientific consultant and designer of a well-known Silurian Reef diorama, first built for a museum in Milwaukee, and later reproduced in many other North American and European museums. Two other Silurian related activities she was engaged in were the designations by the National Park Service of the first described Silurian reefs (Schoonmaker Reef) as National Historic Landmarks in the History of Science and was strong advocate of preserving the Niagara Escarpment and promoting it as an important geotourism destination. Joanne was most proud of her work as the founding Director of the Weis Earth Science Museum in Menasha, Wisconsin. Additional information on Joanne can be viewed at wichmannfuneralhomes.com and in the Summer 2018 GAEA newsletter on the Association For Women Geoscientist website.
Joanne Kluessendorf birthday at Three Chimneys for the Murchison Symposium post meeting field trip on August 4, 1989.