

SILURIAN TIMES No. 15

**Year 2007 (July 2008)
(updated version)**

CONTENTS OF SILURIAN TIMES No. 15

ISSS	2
List of voting and corresponding members of the ISSS	3
Chairman's Corner & Editor's Notes	4
Web Site for the Silurian Subcommittee	4
Annual Report of the Sub-Commission on Silurian Stratigraphy on 2007	5 – 9
Message from the President of the IUGS to the secretary of the IUGS	9
Report of the Subcommittee on Silurian Stratigraphy Restudying the Global Stratotype for the base of the Wenlock: report by David Loydell	10-12
Future Meetings of the ISSS	13-22
Silurian Research 2007	23-33
Silurian Publications 2007	34-41
New Names, Address Changes	41 42
E-Mail Addresses readers of Silurian Times	43-47

SILURIAN TIMES

A NEWSLETTER OF THE

INTERNATIONAL SUBCOMMISSION ON SILURIAN STRATIGRAPHY (ISSS)

INTERNATIONAL COMMISSION ON STRATIGRAPHY

INTERNATIONAL UNION OF GEOLOGICAL SCIENCES

President: Prof. Zhang Hongren (China)

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

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

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NTERNATIONAL COMMISSION ON STRATIGRAPHY

Chairman: Dr. Felix Gradstein (Norway)

Vice-Chairman: Prof. Stanley Finney (USA)

Secretary-General: Prof. James G. Ogg (USA)

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

INTERNATIONAL SUBCOMMISSION ON SILURIAN STRATIGRAPHY (ISSS)

Subcommission officers

Outgoing Chairman: Rong Jiayu, Key Laboratory of Palaeobiology and Stratigraphy, Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, 39# East Beijing Road, Nanjing, 210008, P R China, e-mail: jyrong@nigpas.ac.cn

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

Outgoing Vice Chairman: Tatiana Koren', All-Russia Geological Research Institute (VSEGEI), Sredny Pr. 74, 199026, St. Petersburg, Russia, e-mail: koren@vsegei.sp.ru

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

Secretary: Jacques Verniers, Research Unit Palaeontology, Department of Geology and Pedology, Ghent University, Krijgslaan 281 building S8, BE-9000, Gent, Belgium, e-mail: Jacques.Verniers@ugent.be.

List of Task Groups and their officers

Base of Silurian: Mike Melchin, Canada: mmelchin@stfx.ca

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

List of Titular Members (sept 2008- 2012)

C.E. Brett, Cincinnati, USA, brettce@email.uc.edu

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Jin Jisuo, London, Canada, jjin@uwo.ca

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J. Kríž, Prague, Czech Republic, kriz@cgu.cz

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P. Mannik, Tallinn, Estonia, mannik@gi.ee

M.J. Melchin, Antigonish, Canada, mmelchin@stfx.ca

S. Peralta, San Juan, Argentina, speralta@unsj.edu.ar

P. Štorch, Prague, Czech Republic, storch@gli.cas.cz

J. Verniers, Ghent, Belgium, Jacques.Verniers@ugent.be

Zhan Renbin, Nanjing, China, rbzhan@nigpas.ac.cn

Zhan Renbin: the new SSS Titular Member was voted upon in February 2008,

Prof. Zhan Renbin is a young (he was born in 1965, graduated with a palaeontological specialty of the Geology Department of Nanjing University in 1987; graduated from Nanjing Institute as Master and PhD in 1991 and 1994 respectively), talented and hard working palaeontologist and stratigrapher. He has paid much attention to doing field work in many regions of China and some abroad. He works very hard and has published quite lot of papers during the last 15 years mainly on the Ordovician and Silurian stratigraphy, brachiopods, community ecology, macroevolution, palaeobiogeography and so on. He has very good organization capability. For example he made a major contribution to the organization of the Ordovician-Silurian Conference in China in 2007. He is familiar with general situation of Silurian investigations mainly in China, as well as with the rest of the world. He works conscientiously and earnestly and cooperates with his colleagues friendly and responsibly. He has enjoyed a high national and international reputation. I have been at ease when I asked him to do work. So I strongly recommend and nominate him as a voting member of the SSS."

INTERNATIONAL SUBCOMMISSION ON SILURIAN STRATIGRAPHY (ISSS)
List of titular and corresponding members from September 2008 – 2012 (in Silurian Times 15)

Chairman: Rong Jiayu (China) (until 2008) and Mike Melchin (from 2009)
Vice-Chairman: T.N. Koren' (Russia) (until 2008) and P. Männik (Estonia) (from 2009)
Secretary: J. Verniers (Belgium)

Titular Members: n=14

C.E. Brett (USA)	A. Le Hérissé (France)
Zhan Renbin (China)	D.K. Loydell (UK)
D. Holloway (Australia)	P. Männik (Estonia)
J.-s. Jin (Canada)	M.J. Melchin (Canada)
M.E. Johnson (USA)	S. Peralta (Argentina)
T.N. Koren' (Russia)	P. Štorch (Czech Republic)
J. Kříž (Czech Republic)	J. Verniers (Belgium)

Corresponding members (n= 62) (without date: corresponding member from before 1995)

Aldridge (UK)		Legrand (France)	
Antoskhina (Russia)		Lesperance (Canada)	
Baarli (USA)	2002	Maletz (USA)	2002
Barnes (Canada)		Märss (Estonia)	
Bassett (UK)		Musteikis (Lithuania)	
Berry (USA)		Nestor H. (Estonia)	
Bjerreskov (Denmark)		Norford (Canada)	1995/1996
Blieck (France)		Paris (France)	
Bogolepova (UK)	2002	Piçarra (Portugal)	
Boucot (USA)		Predtechensky (Russia)	
Calner (Sweden)	2005	Radziadicius (Lithuania)	2007
Caputo (Brazil)		Rickards (UK)	
Chen (China)		Robardet (France)	
Cocks (UK) ^o		Rong, Jiayu (China)	
Corradini (Italy)	2007	Schonlaub (Austria)	
Einasto (Estonia)	1996	Sennikov (Russia)	1999
Eriksson,	2005	Serpagli (Italy)	
Fan Junxuan (China)	2005	Simpson (Australia)	2002
Ferretti (Italy)	1996	Storch (Czech Rep.)	
Fu (China)		Strusz (Australia)	
Geng (China)		Su (China)	
Gutierrez-Marco (Spain)	1995	Suyarkova (Russia)	2007
Hansch (Germany)		Tang Peng (China)	2005
Hints (Estonia)	2007	Teller (Poland)	
Holland (Ireland)		Tesakov (Russia)	
Jell (Australia)		Walliser (Germany)	
Jeppsson (Sweden)	1995	Wang Nian Zhong (China)	1999
Kaljo (Estonia)		Wang Yi (China)	2005
Kozłowska (Poland)		Yolkin (Russia)	
Larsson (Sweden)		Zhan Renbin (China)	2005
Lawson (UK)		Zhang Yuan Dong (China)	1999
Lenz (Canada)		Zigaite (Lithuania)	2007

CHAIRMAN'S CORNER

Dear colleagues,

The New Year 2008 has already come. Dr. Jacques Verniers, the secretary of the Silurian Stratigraphy Subcommittee (SSS) has completed the edit work on this new issue of the <Silurian Times> from which you will know recent contributions to Silurian stratigraphy all over the world during the last year. Since 2000 I have been grateful to all of you who replied to Jacques's requests and again to Jacques for his careful and patient work.

One of the most interesting fields in study of the Silurian is that many recent chemostratigraphic works suggest that it was not stable since the global carbon cycle, for example, in the Silurian went through considerable changes and more frequently than during any other period of the Phanerozoic although the Silurian was considered to have been a time of stable greenhouse environmental conditions. We are hoping that more people will join this work to study more time intervals, more regions, and more tightly linked with fine Silurian biostratigraphy. Emphasis on the concept of Earth System is greatly appreciated. It is our task to interpret global changes and the responses of marine and land organisms to the changes.

We work on different kinds of fossils and rocks, come from different countries, are of different ages, have different careers passes and educations, and speak different native languages. By opportunity and interest, sometime by coincidence, we came together to study related scientific problems, and became colleagues and friends. We will cherish our time and treasure the opportunity to expand our knowledge and to explore the secrets of the ancient world. A harmonious atmosphere, equality among scientists, respect to each other, and cooperation with mutual interests and benefits are mostly appreciated. We believe that further work will be creative, smooth and successful.

The field excursion of the SSS will be held in Sardinia, Italy in August, 2009. Dr. Carlo Corradini and his colleagues have been spending their time and energy for organization and preparation. By this chance, I would like to thank them very much for doing this important job. I wish many of you would take part in this meeting.

Rong Jiayu, chairman (8 Feb. 2008).

EDITOR'S NOTES

I wish to thank all of those who contributed to this issue and apologise to anyone whose contributions I may have inadvertently left out. We have received the current projects and recent publications of 52 voting or corresponding members. The list of Silurian workers who showed an interest to receive "Silurian Times" contains close to 250 persons. Possibly more researchers could send the Silurian community about their current projects and publications. My apologies again for the delay in assembling this newsletter.

Jacques Verniers, Secretary (5 July 2008)

THE WEB SITE FOR THE SILURIAN SUBCOMMISSION

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

ANNUAL REPORT OF THE INTERNATIONAL SUBCOMMISSION ON SILURIAN STRATIGRAPHY (ISSS) OF THE INTERNATIONAL COMMISSION ON STRATIGRAPHY



International Commission on Stratigraphy
Subcommission on Silurian Stratigraphy
ANNUAL REPORT 2007

1. TITLE OF CONSTITUENT BODY

International Subcommission on Silurian Stratigraphy ISSS

Submitted by:

Rong Jiayu, *Chairman, ISSS*

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2. OVERALL OBJECTIVES, AND FIT WITHIN IUGS SCIENCE POLICY

Mission statement

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

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

Goals

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

3. ORGANIZATION

The ISSS is a Subcommission of the Commission on Stratigraphy. The Subcommission is organized by an Executive consisting of Chairman, Vice-Chairman and Secretary, who are all Voting Members of the Subcommission. In the new Subcommission elected for 2004-2008 there are twelve other Voting Members. The network of Corresponding Members have first of all a responsibility for communication in both directions between the Subcommission and researchers on Silurian topics in their region. Secondly they represent a broad spectrum of specialized stratigraphical disciplines from

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

Officers for 2004-2008:

Chair: Rong Jiayu, Nanjing, China.
Vice-Chair: T. N. Koren', St. Petersburg, Russia.
Secretary: J. Verniers, Ghent, Belgium (2005-2008)

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

Websites: <http://www.silurian.cn/home.asp> contains newsletters, meeting announcements, discussion posting-boards, bibliography of Silurian articles, links to related sites, and other information. The former web site for the Silurian Subcommittee:
<http://iago.stfx.ca/people/mmelchin/SILURIAN.HTML> has access to pre-2005 issues of *Silurian Times* in PDF format.

4. INTERFACES WITH OTHER INTERNATIONAL PROJECTS

Jointly with the **International Subcommittee on Ordovician Stratigraphy** the joint meeting of the ISSS in Nanjing in 2007 was organized.

Collaboration on an IGCP Project N° 503 entitled “*Ordovician Palaeogeography and Palaeoclimate*”.

5. CHIEF ACCOMPLISHMENTS AND PRODUCTS IN 2007

The year 2007 has been the culmination of more than 2 years of work of the ISSS with the organization of the 3rd International Symposium on the Silurian System and the IGCP 503 4th Annual meeting both in Nanjing, China, 27 – 30 June, 2007. They were held together with the 10th International Symposium on the Ordovician System and was called the “Yangtze Conference on Ordovician and Silurian”. All authors presenting a talk or poster will have their extended abstracts submitted to the organizers by the end of 2006.

In June 2006 we saw the rapid publication in the international journal GFF of selected talks and posters presented at the Silurian Field Meeting in Gotland, Sweden August (15-22, 2005). Titles and authors can be found on <http://www.gff-online.se/site/part.asp?partID=38>. The theme for the field meeting was the global dynamics of the Silurian Period. In particular, the meeting and field trips focussed on important events of biotic and palaeoenvironmental changes as represented in the fossil, sedimentological, and chemostratigraphical record associated with their interpretation. The guest editors Mikael Calner and Mats E. Eriksson did an excellent job in the production of this high level publication, in less than a year after the symposium.

Silurian Times No 14 was edited by the secretary in later 2006, and circulated as an email attachment to all Honorary, Voting and Corresponding Members of the Subcommittee in June 2007. It contained the result of the votes on the base of the Silurian, the final report on the restudy of the base of the Wenlock, the second circular for the 3rd International Symposium on the Silurian System and the IGCP 503 4th Annual meeting both in Nanjing, China, 27 – 30 June, 2007 and the latest news on Silurian research,

The new web site for the ISSS at <http://www.silurian.cn/home.asp>, created in 2005 by Fan Juanxuan and Zhao Hui at the Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, under the direction of Rong Jiayu, ISSS Chair, has been updated with the *Silurian Times* No.13 (2005), the Second Circular of the Yangtze Conference on Ordovician and Silurian (27-30 June, 2007), and news about oncoming meeting.

6. CHIEF PROBLEMS ENCOUNTERED IN 2006

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

7. SUMMARY OF EXPENDITURES IN 2007

INCOME

Carried forward from 2006		00.00
ICS Allocation	US\$300 converted to	€236.16
	less bank charges of € 6.05 =	€230.11
TOTAL		€230.11

EXPENDITURE FROM 2007 BUDGET

General office expenses	□	130.11
ISSS Newsletter 13 preparation	□	100.00
TOTAL	□	230.11

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

8.a Preparation of the Yangtze Conference on Ordovician and Silurian (Nanjing, China, 27 – 30 June, 2007) with our 3rd International Symposium on the Silurian System, in collaboration with the 10th International Symposium on the Ordovician System and the IGCP 503 4th Annual meeting. A considerable work on the organization of this major symposium has been preparing by Chinese colleagues at Nanjing since 2004. The preparation is going very well and we believe that the conference will be held in Nanjing very smoothly next year.

8b. Regular updating the website for Silurian Subcommittee.

8d. Publication of Silurian Newsletter 15 (2007):

8e. IGCP Project 503:

South European Regional Team Meeting, Field workshop, Zaragoza, Spain September 2007

9. BUDGET AND ICS COMPONENT FOR 2007

Transportation, accommodation & registration to participate in the Yangtze Conference in Nanjing 2007

\$1000.00

Note that Dr. Koren had no funds for international travel from her institute in Russia.

General office expenses	\$100.00
ISSS Newsletter 14 preparation	\$100.00
Total:	\$1200.00

Potential funding sources outside IUGS

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

own authorities. It is hoped that the major meeting in Nanjing China (2007) will receive financial support from the respective national Ministries, but extent and purposes of this cannot be predicted at this stage.

10. CHIEF ACCOMPLISHMENTS OVER PAST FIVE YEARS (2003-2007)

Over the period of 2003-2007 the Subcommittee on Silurian Stratigraphy was active in several respects.

1) New York State Museum Bulletin 493 (Title: "*Silurian Lands and Seas---Paleogeography Outside of Laurentia*") was released in May 2003. The Bulletin consists of eleven contributed papers that cover Silurian palaeogeography, plate tectonic assembly, stratigraphy, and biogeography in North Africa, southern and central Europe, China, Kazakhstan, the Baltic region (including Scandinavia), Avalon, the Russian "Far East," northern Siberia, Australia and New Guinea, and the Himalayan countries and southeast Asia.

2) The field meeting of the ISSS was held in San Juan, Argentina in August, 2003, in connection with an International Symposium on the Ordovician System and an International Graptolite Conference. Field trips and the conference sessions were well organized and well attended. Accompanying this conference was the publication of the volume entitled "*Proceedings of the 7th International Graptolite Conference & Field Meeting of the International Subcommittee on Silurian Stratigraphy. INSUGEO, Serie Correlación Geológica. 18 Comunicarte Editorial, Córdoba, Argentina*" edited by G. Ortega and G.F. Aceñolaza.

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

4) The restudy of the base of the Silurian System. A restudy of the GSSP for the **Base of Silurian** was prepared in 2002 (?) by a working group under the leadership of Mike Melchin. Through 3 year work, the working group has unanimously agreed that the current GSSP, at 1.6 m above the base of the Birkhill Shale, at Dob's Linn, Scotland, should be maintained as the GSSP, but the biostratigraphical definition of the boundary needs to be revised. The GSSP should be regarded as coinciding with the first appearance of *Akidograptus ascensus*, defining the base of the *A. ascensus* Biozone at that GSSP section. By the middle of March 2006 all titular members have voted in favour of the proposal of Mike Melchin for the base of the Silurian at Dob's Linn.

5) Regarding the restudy of the base of the Wenlock Series. The working group to restudy the **Base of the Wenlock Series** (base of Sheinwoodian Stage) was led by David Loydell, looked at potential GSSP sections in the Czech Republic and Wales, as possible alternatives to the current GSSP in England. The primary marker for the base-Wenlock was a graptolite, but the GSSP in England is notably poor in allowing exact determination of their ranges. Recent evidence has shown that the current GSSP does not coincide with the base of the *Cyrtograptus centrifugus* Biozone, as was supposed when the GSSP was defined. It has been suggested to retain the GSSP location in England but revise the level of the GSSP slightly to coincide with a conodont event -- the Ireviken conodont datum 2, which coincides approximately with the base of the lower *murchisoni* graptolite biozone (instead of the current *centrifugus* graptolite zone). Alternatively, another GSSP locality with a precise base of the *Cyrtograptus centrifugus* Biozone could be chosen (e.g., potential sections in Great Britain and the Czech Republic), but this process would be quite lengthy. The report of this work at the Silurian Field Meeting in Gotland, in August, 2005, was discussed over the winter and spring, 2006. Most voting members appreciated very much the amount of work by the working group and especially the leader of the group. But most felt that for the moment that no good alternative for the previous GSSP can be proposed. It was decided not to propose a new GSSP and stick for the time being to the old GSSP, although it had many shortcomings, until new studies

can propose a better alternative. This time consuming study could however not be effectuated before the deadline of the ISC, ending at the International Geological Congress in Oslo summer 2008.

6) An International Conference on the Silurian System is planned for Nanjing, China, in 2007, to be hosted by the Nanjing Institute of Geology and Palaeontology. The work on preparation and organization for this meeting has been carried out effectively and smoothly.

OBJECTIVES AND WORK PLAN FOR NEXT 4 YEARS (2007-2010)

For those of us who are interested in the geology of the Silurian, the four-yearly International Symposium is a priority and these will be "officially" supported and sponsored as resources allow.

The priorities (not in order of merit) proposed for the Silurian Subcommittee for the next four years include:

1. Substage Working Groups to propose GSSPs for Substages as appropriate,
2. Involvement in the aims and objectives of IGCP Project 503
3. Developing and expanding the Thematic Working Groups: for example, searching for and interpreting data from all sources relevant to reconstructing the palaeobiogeography or the climate of one or more specific time-intervals. In part this will be given further impetus by involvement in IGCP Project 503.
4. Investigate the establishment of data-bases which would bring together and make available information from all sources associated with the Silurian researchers.

2007

- a. Discussion on possible re-study of other Silurian GSSP's.
- b. Nanjing meeting and field excursion for the Ordovician and Silurian Subcommittee on Stratigraphy in Nanjing and Southwest China (upper Yangtze Platform: mainly Llandovery--Rhuddanian, Aeronian, and Telychian)
Continued discussion on **Llandovery/Wenlock boundary**
Further work on possible new GSSP re-studies
New members for next four years
- c. Silurian *Times* (edited by the secretary)

2008

- a. Possible vote on **Llandovery/Wenlock boundary**
- b. Possible continued further re-study of other GSSP's.
- c. Election of new officers and members
- d. Silurian *Times* (edited by the secretary)

Message on 17 august 2007 from the Secretary General of the IUGS, Dr. Peter T. Bobrowsky to the Secretary General of the IUGS, Jim Ogg, and forwarded to the ISSS chairman, Rong Jiayu.

“ ... This is to inform you that the IUGS Executive Committee ratifies the following:

(3) For the Base Silurian, the GSSP should be regarded as coinciding with the first appearance of the graptolite *Akidograptus ascensus*, defining the base of the A. ascensus Biozone at that GSSP section. Votes were 6 in favour and 3 opposed....”

Final Report of the Subcommittee on Silurian Stratigraphy Restudying the Global Stratotype for the base of the Wenlock Series.

Note: This report was omitted in error from the previous issue.

The base of the Wenlock Series

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Formal definition of the base of the Wenlock

*'The boundary stratotype for the base of the Wenlock Series is in Hughely [sic] Brook 200 metres south-east of Leasows Farm and 500 metres north-east of Hughley Church, Apedale, Shropshire, England (British National Grid Reference SO 5688 9839). The marker point (stratotype) for the base is in the left (north) bank of the stream at the base of lithological unit G as described by Bassett *et al.* 1975:13 and Fig. 5; this point is coincident with the standard base of the Sheinwoodian Stage (see below) and the Buildwas Formation, and correlates with the base of the *Cyrtograptus centrifugus* graptolite Biozone.'*

(Martinsson, Bassett and Holland 1981, p. 168)

The problem

It is the last statement of the announcement above that has created a serious problem for those working on projects in which precise delimitation of the base of the Wenlock Series has been required. Unfortunately, graptolites do not occur at the GSSP. Thus there could be no direct evidence to indicate that the base of the Wenlock Series correlates with the base of the *Cyrtograptus centrifugus* graptolite Biozone.

Restudying the GSSP for the base of the Wenlock Series

Following discussion at the business meeting of the Subcommittee on Silurian Stratigraphy (SSS) in Orange, New South Wales, in July 2000 and subsequent support by a majority of voting members by correspondence, it was agreed that the GSSP for the base of the Wenlock was in urgent need of restudy and I was asked to serve as 'leader and organizer' of a working group to undertake this work. Regular progress reports have appeared in *Silurian Times* (Loydell 2001, 2002, 2003, 2004).

Retaining Hughley Brook as GSSP for the base of the Wenlock Series

At the business meeting of the SSS at the recent (August 2005) Gotland Meeting I made the recommendation that Hughley Brook be retained as the GSSP for the base of the Wenlock Series.

I made this recommendation for two reasons:

(1) At the business meeting of the SSS in Argentina in August 2003 those titular members present were unanimous in their view that stability would best be served by retaining the base of the *Cyrtograptus centrifugus* Biozone as that of the Wenlock Series (M. J. Melchin pers. comm., 2nd September 2003). However, this requires erection of a replacement GSSP that exposes the base of this biozone in a richly graptolitic section, yielding also chitinozoans and/or conodonts. Such a section would once have existed in the Czech Republic, but the expansion of Prague has meant that only one section through the Llandovery-Wenlock boundary remains, at Malá Chuchle-Vyskočilka. This section is very dangerous, currently poorly exposed, intruded by a basalt sill

and yields only poorly preserved palynomorphs. Other sections considered (Banwy River section, Wales; Corral de Calatrava and El Pintado sections, Spain; Xianzhonggou section, China; sections in Bulgaria) all proved to be inappropriate, because of the presence of an unconformity at the boundary level or slumping close to this level or poor palynomorph preservation. Sections in Arctic Canada are not yet fully documented and are inaccessible without a helicopter. Two sections in Wales, within the Dyfnant Forest and in the Trannon River, are likely, but not guaranteed, to expose the base of the *centrifugus* Biozone. Test samples indicate that they both yield well preserved chitinozoans. Both sections, being basinal, are thick and their study would require years of work (estimated from the amount of time required to complete the Banwy River study; Loydell and Cave 1996; Mullins and Loydell 2001). The International Commission on Stratigraphy has the mandate of completing selection of all GSSPs by 2008. It is inconceivable that study of these two sections could be completed by this time, given the other work commitments of those with appropriate expertise to undertake this work. It is, however, recommended that both sections be studied in the future as they will add very useful data to enable enhanced correlation of graptolite and chitinozoan biozones through the upper Telychian and lower Sheinwoodian.

(2) Jeppsson (1997, p. 95) stated that the base of the Wenlock Series ‘occurs within a few centimetres from the base of the Upper *Ps. bicornis* Zone.’ The base of this conodont biozone equates with Datum 2 of the Ireviken Event (see Jeppsson 1998, fig. 3) marked by the LADs of several conodont taxa. At Hughley Brook, Datum 3, marked by the LAD of *Pterospathodus amorphognathoides amorphognathoides* occurs only 67 mm above the GSSP, in sample 38 of Mabillard and Aldridge 1985 (note that the higher records of this taxon in Mabillard and Aldridge 1985 are *P. procerus* according to re-examination of the collections by L. Jeppsson and R. Aldridge; L. Jeppsson pers. comm. 8 September 2005).

The stratigraphical precision offered by the GSSP can be assessed by reference to work on the Ohesaare core, Estonia and Aizpute-41 core, Latvia, by Loydell *et al.* (1998, 2003). These cores yield graptolites, conodonts and chitinozoans and thus enable correlation of the biozones erected using these different groups. Datum 3 of the Ireviken Event was recognised in the Aizpute-41 core as occurring low to mid-way through the *Cyrtograptus purchisoni* graptolite Biozone. Datum 2 was more difficult to recognise, but correlated either with the base of or a level within the *Cyrtograptus purchisoni* graptolite Biozone in the Aizpute-41 core.

The Sheinwoodian is currently estimated to be 2 million years in duration (Melchin *et al.* 2004). The number of graptolite biozones recognised in the Sheinwoodian is generally four or five (Zalasiewicz and Williams 1999, fig. 4). Thus on average each zone had a duration of 400,000 or 500,000 years. The time represented between these two key Ireviken Event datum points (2 and 3) within the lower part of the *Cyrtograptus purchisoni* graptolite Biozone is likely therefore to be significantly less than half a million years.

The recent work of Mullins and Aldridge (2004) on the chitinozoans of the Hughley Brook section offers further correlative evidence for the level in the graptolite biozonation of the base of the Wenlock Series. Mullins and Aldridge (2004) recognised several biostratigraphically important chitinozoan taxa in the Hughley Brook samples that enable correlation with graptolitic sections elsewhere. They concluded (Mullins and Aldridge 2004, p. 771) that the base of the Wenlock Series at Hughley Brook lies at a level high in the *Margachitina margaritana* chitinozoan Biozone correlating with a level between the upper *centrifugus* graptolite Biozone and lower *purchisoni* graptolite Biozone. This is consistent with the correlation based on the Aizpute-41 core (Loydell *et al.* 2003), referred to above.

Thus Hughley Brook contains a succession of biostratigraphically useful conodonts and chitinozoans, together with the acritarchs and ostracods documented by Mabillard and Aldridge (1985). Correlation into graptolitic sequences is possible and indicates that the ‘golden spike’ at Hughley Brook correlates with the level at the base of or low within the *Cyrtograptus purchisoni* Biozone. At the recent (September 2005) meeting of the International Commission on Stratigraphy at Leuven, the base of the Wenlock Series was discussed. The opinion of the Commission is that the GSSP should be retained at Hughley Brook and the biostratigraphical level changed from the base of the *Cyrtograptus centrifugus* graptolite Biozone.

Conclusions

1. Hughley Brook should be retained as the GSSP for the base of the Wenlock Series.

2. In the conodont biozonation, the base of the Wenlock Series lies very close to the base of the Upper *Pseudooneotodus bicornis* Biozone, equivalent to Ireviken Event Datum 2.
3. In the graptolite biozonation, the base of the Wenlock Series lies at the base of or low in the *Cyrtograptus purchisoni* Biozone.
4. In the chitinozoan biozonation, the base of the Wenlock Series lies in the upper part of the *Margachitina margaritana* Biozone.

N.B. Conclusion 2 above, that the base of the Wenlock Series lies very close to Ireviken Event Datum 2, is not immediately apparent from examination of Mabillard and Aldridge's (1985) text-figure 6. Jeppsson's (1997, p. 95) comment was based upon his examination of the Mabillard and Aldridge collections held at the University of Leicester. Peep Männik has also examined the Mabillard and Aldridge collections. His view (pers comm., 2 September 2005) is that Datum 2 occurs somewhere between Mabillard and Aldridge's samples 36 and 39, the lower of which is 125 mm below the base of the Wenlock Series. Professor R. Aldridge has kindly offered to examine these conodont collections again to determine whether Datum 2 can be even more precisely located within the Hughley Brook section.

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MEETINGS IN 2008 AND FUTURE MEETINGS in 2009

7th Baltic Stratigraphical Conference 15-22 May 2008 (including excursions), Tallinn, Estonia

The 7th Baltic Stratigraphic Conference will take place on May 17-18, 2008 in Tallinn, jointly organized by the Institute of Geology at Tallinn University of Technology and the Department of Geology, University of Tartu. The meeting will be preceded and followed by geological excursions including Silurian excursion to western Estonia and Saaremaa Island on May 20-22, 2008, and bentonite excursion and workshop on May 15-16, 2008.

All contributions related to geology and stratigraphy of the Baltic region are most welcome. Depending on the interest and number of papers, different sessions will be organized.

The topics of primary interest include, but are not limited to:

- * Regional stratigraphical schemes, correlation and stratotypes
- * Regional aspects of the international timescale
- * Biostratigraphy and paleontology
- * Biodiversification
- * Sequence stratigraphy
- * Quantitative stratigraphy
- * Quaternary geology
- * Ordovician paleogeography and paleoclimate (IGCP 503 session)
- * Volcanic ash layers and their utility for stratigraphy, facies analyses and diagenetic history research

More information is available on the conference website at <http://www.gi.ee/7bsc>

After the conference, all presentations, abstracts and excursion guidebooks will be deposited there.

Estonian Journal of Earth Sciences

Starting from 2007 the quarterly peer-reviewed geological journal formerly known as *Proceedings of Estonian Academy of Sciences - Geology* has been renamed to *Estonian Journal of Earth Sciences*. Together with the name change, the format was increased and the layout changed to better accommodate geological and palaeontological contributions. The editorial policies were also reviewed and the journal is now declared as an Open Access journal, with all papers starting from 2006 being freely available for downloading and redistributing from the publishers website at <http://www.kirj.ee/earthsciences> as well as from the Directory of Open Access Journals (<http://www.doaj.org>).

The journal has traditionally covered an important part of the Silurian research in the eastern Baltic area. In 2007, six out of 16 research papers published in the journal were devoted to the Silurian System. The geographical scope of the journal is nevertheless not limited to Estonia or Baltic region and thus we invite you to submit manuscripts from other regions and on different topics of Silurian stratigraphy and palaeontology. Shorter papers can usually be published very quickly. Full instructions for authors are available at <http://www.kirj.ee/earthsciences>.

Dimitri Kaljo, Editor-in-Chief

Olle Hints, Associated Editor (palaeontology and stratigraphy)



International conference
“DEVELOPMENT OF EARLY PALEOZOIC BIODIVERSITY:
ROLE OF BIOTIC AND ABIOTIC FACTORS, AND EVENT CORRELATION”
(IGCP Project 503)
Moscow, Russia, 26 - 28 June, 2008
Altai, Russia, 30 June – 11 July, 2008 *(post- conference field excursion)*

SECOND CIRCULAR OF CONFERENCE

Organizers

Paleontological Institute of the Russian Academy of Sciences (PIN RAS)
 Siberian Branch of the Russian Academy of Sciences (SB RAS)
 Institute of Petroleum Geology and Geophysics, SB RAS (IPGG SB RAS)
 Interdepartmental Stratigraphic Committee of Russia (ISC)
 IGCP Project 503 – "Ordovician Paleogeography and Paleoclimate"
 Subcommittee on the Ordovician Stratigraphy (SOS) of the International Commission on Stratigraphy
 Subcommittee on the Silurian Stratigraphy (SSS) of the International Commission on Stratigraphy

Sponsors

Russian Academy of Sciences
 Presidium of the Siberian Branch of Russian Academy of Sciences
 Russian Foundation for Basic Research (RFBR)
 Scientific Research Program № 18 of the Presidium of RAS «The Origin and Evolution of the Biosphere»
 Scientific Research Program № 11 “Biodiversity and Dynamic of Genetic Pools”
 National IGCP Committee of Russia
 Siberian Regional Interdepartmental Stratigraphic Committee (SRISC)

International Scientific Committee

S.V.Rozhnov, Co-Chairman	Paleontological Institute RAS, Moscow, Russia
N.V.Sennikov, Co-Chairman	Institute of Petroleum Geology and Geophysics, SB RAS, Novosibirsk, Russia
A.Achab	Canada
CHEN Xu	China
L.R.M.Cocks	UK
A.V.Dronov	Geological Institute RAS, Moscow, Russia
O.Fatka	Czech Republic
J.C.Gutierrez-Marco	Spain
D.A.T.Harper	Denmark
D.Kaljo	Estonia
A.V.Kanygin	IPGG, SB RAS, Novosibirsk, Russia
T.N.Koren	VSEGEI, St. Petersburg, Russia
A.Munnecke	Germany

A.W.Owen	UK
RONG Jiayu	China
T.Servais	France
P.M.Sheehan	USA

Organizing Committee

S.V. Rozhnov, Co-Chairman	Paleontological Institute RAS, Moscow
N.V. Sennikov, Co-Chairman	Institute of Petroleum Geology and Geophysics, SB RAS
V. Kushlina, Scientific Secretary of conference	Paleontological Institute RAS, Moscow
O. Obut, Scientific Secretary of post-conference field-excursion	Institute of Petroleum Geology and Geophysics, SB RAS, Novosibirsk
A. Madison	Paleontological Institute RAS, Moscow
A.Pahnevich	Paleontological Institute RAS, Moscow
S. Nikolaeva	Paleontological Institute RAS, Moscow
O. Lebedev	Paleontological Institute RAS, Moscow

Three-day scientific program of the International conference “Development of Early Paleozoic Biodiversity: Role of Biotic and Abiotic Factors and Event Correlation”

- International Ordovician and Silurian Stratigraphic Scale
- Zonal scales and the problem of their correlation
- Bio- and sedimentary events
- Paleogeographic and paleoclimatologic reconstructions
- Evolution of taxonomic diversity
- Reconstruction of food chains and evolution of trophic structure of communities
- Sedimentary basins and environments
- Chemostratigraphy

Language

The official languages of the Conference are English and Russian.

Registration Fee

€ 200

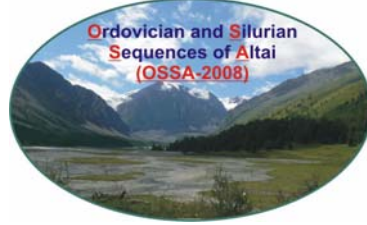
Accommodation

Hotel in Moscow (breakfast included): € 85 per night, single room.

Social program

The excursions to the Moscow Kremlin, Armoury Chamber and Diamond Fund.

SECOND CIRCULAR OF POST- CONFERENCE FIELD EXCURSION



**ORDOVICIAN-SILURIAN SEQUENCES
IN THE SOUTH OF WEST SIBERIA
(KEY SECTIONS AND PALEO GEOGRAPHY, GORNY ALTAI)
(OSSA-2008)**

June 30 – July 11, 2008

Organizers

Siberian Branch of the Russian Academy of Sciences (SB RAS)
Institute of Petroleum Geology and Geophysics, SB RAS (IPGG SB RAS)
Paleontological Institute of the Russian Academy of Sciences (PIN RAS)
Interdepartmental Stratigraphic Committee of Russia (ISC)
IGCP Project 503 – "Ordovician Paleogeography and Paleoclimate"
Subcommission on the Ordovician Stratigraphy (SOS) of the International Commission on Stratigraphy
Subcommission on the Silurian Stratigraphy (SSS) of the International Commission on Stratigraphy

Sponsors

Russian Academy of Sciences
Presidium of the Siberian Branch of Russian Academy of Sciences
Russian Foundation for Basic Research (RFBR)
Scientific Research Program № 18 of the Presidium of RAS «The Origin and Evolution of the Biosphere»
National IGCP Committee of Russia
Siberian Regional Interdepartmental Stratigraphic Committee (SRISC)

Subjects emphasized in the conference and field trip:

1. International Ordovician and Silurian Stratigraphic Scale
2. Zonal scales and the problem of their correlation
3. Bio- and sedimentary events
4. Paleogeographic and paleoclimatologic reconstructions
5. Sedimentary basins and environments

General schedule (dates are tentative and could be changed due to the Scientific Committee members propositions)

29.06.08 Arrival in Novosibirsk, accommodation in the hotel, registration for excursion in the IPGG, brief introductory information.
30.06.08 – 11.07.08 Post-Conference Field Trip. Duration – 12 days.
12.07.08 – 13.07.08 Departure

Costs (in Euros)

Accommodation (hotel in Novosibirsk) about 60 Euro (per 1 night and reservation, without breakfast)

Field excursion 575 Euro

Accommodation in field camps, field meals, transportation, guide book

Start of the Field excursion from Novosibirsk. Route from Novosibirsk to the first camp in the North-Western Altai is about 650 km.

Transport and food

For transportation in the field there will be the following vehicles: bus, 4WD tracks and jeeps. Excursion costs including food supply (breakfast, lunch packages, dinner, beverages).

Clothing and field facilities

You are advised to bring your field boots, warm sweaters, raincoats, swimming suit, caps, hammer and others. Participants will be provided with tents, sleeping bags and other field gear. It is planned to stay in four field camps during the excursion, with distances between camps about 250-450 km.

Weather conditions

Novosibirsk is situated in the southern part of West Siberia E89 N55. Typical temperatures in the Gorny Altai are about +20-25⁰ C (day), rarely +30⁰ C, and +5-15⁰ (night). Occasional rain is possible. Heavy dew on the grass in the morning.

Geographical settings

Low and medium high mountains, taiga, mountain meadows. Exposures are along the river banks, on the slopes and tops of hills and mountains, in trenches and quarries.

Geochronology

All Ordovician and Silurian stages: Age of most Ordovician stages is dated mainly by graptolites and rarely by conodonts. Ordovician regional stages (in Russian terminology – horizons) in Altai are established on the basis of graptolites, trilobites and brachiopods.

As to Silurian stages, Rhuddanian, Aeronian, Telychian and Sheinwoodian stages are recognized mainly by graptolites, and in less by conodonts, Homesian and Ludlowian and Pridolian – mainly by trilobites and brachiopods, with few conodonts.

Silurian regional stages (in Russian terminology – horizons) in Altai are established on the basis of graptolites, trilobites and brachiopods.

Sedimentary types

- Oceanic
- Shelf

Rocks:

1. siliceous-terrigenous,
2. terrigenous,
3. carbonate-terrigenous,
4. carbonate (including reefal)

Paleogeographical zones:

1. near-shore, including rivers' delta front,
2. inner shelf,
3. inner slope of the carbonate platform,
4. central part and outer slope of the carbonate platform,
5. deep-water shelf,
6. continental slope.

Fossils

Graptolites, conodonts, chitinozoans, radiolarians, trilobites, brachiopods, gastropods, crinoids, scolecodons, tabulate and rugose corals, bryozoans, algae.

Cultural program

1. Kolyvan' stone working factory founded in 1802. World-famous giant ovoid vases from the Remnyov jaspers stored in Paris and Sankt-Petersburg (Hermitage) have been produced there at the beginning of 19 century. In XX century they have created the mosaic panels decorated Novosibirsk subway stations.
2. Archeological monuments reflected history of ancient Siberian tribes:
 - The Denisova Cave in the Anui River valley is one of the most ancient dwelling places of humans in the Altai Mountains (more than 200 thousand years). It is believed to be evidence for the occupation of this territory by early *Homo sapiens*.
 - Scythians burial mounds. New ways of living and production – nomadic and semi-nomadic cattle breeding become wide-spread at the middle of the 1st millennia B.C. on the vast territories from Carpathians to Pacific Ocean. Thus, the early Iron Age or epoch of early nomads has began. These Indo-Europeans-nomads spoken one of the ancient Iranian languages were called Scythians. Most of them lived in Trans-Urals. Unique artifacts of Scythian culture were discovered from the burial mounds in the Gorny Altai. Among them Pazyryk cultural heritage (IV-III centuries B.C.).
3. Teletskoe Lake (“Ataian Baikal”), boat trip. In shape, water and air cleanness Teletskoe Lake resembles Baikal. Extension of the lake is 70 km, its area - 22 300 hectare, with maximum depths 325 m. Altitude is 436 m.

The Third circular with the additional information on the meeting and itinerary of the field excursion will be sent in April.

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Fax +7 (495) 339 1266

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Novosibirsk, 630090
Russia
Tel. +7 (383) 333 2431
Fax +7 (383) 333 2301

Contact address for all members of Organizing Committee: pz-conference@mail.ru

Scientific event:

Graptolite Treatise Workshop & IPA Graptolite Working Group Meeting

It will be held in Svaty Jan Pod Skalou near Prague in **July 15th-24th, 2008**. It is organized by Petr Štorch, Institute of Geology AS CR and Petr Kraft, Faculty of Science, Charles University. See <http://www.gli.cas.cz/storch/gwg> for further information.

Symposium “Paleozoic Seas”

A symposium on “Paleozoic Seas” as contribution to the “International Year of Planet Earth” (2007-2009) is scheduled for **summer 2009** in **Graz (Austria)**.

Those who are interested are kindly invited to respond to the following email: thomas.suttner@uni-graz.at. Updates and circulars will be provided soon – please check: <http://palstrat.uni-graz.at/>

Proposed topics:

- Iapetus Ocean
- Panthalassic Ocean
- Paleo-Tethys Ocean
- Rheic Ocean
- Tornquist Sea

SILURIAN FIELD MEETING IN SARDINIA, ITALY, IN 2009.

(Already announced in newsletter 14)

“Time and life in the Silurian: a multidisciplinary approach”. Petr Storch, Enrico Serpagli and Annalisa Ferretti announce the ISSS field-meeting in **Sardinia (Italy), June 4-11 in 2009**

Dear Silurian workers,

The Subcommittee on Silurian Stratigraphy and associated researchers will meet in 2009 in Sardinia, Italy, from June 5th to 7th. Scientific sessions as well as the ISSS Business. The main emphasis will be paid to integrated multidisciplinary studies in Silurian rocks and fossil biota. The meeting will be held in Cagliari. Four days of field trip in the southern part of the island will follow the meeting where relatively deep water limestone and black shale facies will be demonstrated in a selected number of outcrops and sections.

Please find attached the first circular and the information form. Additional information is available on the meeting website (www.unica.it/silurian2009). If you are interested in taking part to the meeting, please return the information form.

We hope for good weather, brilliant talks, and a productive meeting.

On behalf of the Organizing Committee,
Carlo Corradini, Annalisa Ferretti, Petr Storch

All information: Prof. Carlo Corradini Dipartimento di Scienze della Terra Università di Cagliari via Trentino 51 - I-09127 Cagliari (Italy) ph. (+39) 070 6757744; fax. (+39) 070 282236 corradin@unica.it.



The Subcommittee on Silurian Stratigraphy and associated researchers will meet in 2009 in Sardinia, Italy, from June 5th to 7th. Scientific sessions as well as the ISSS Business Meeting will be held in Cagliari. Four days of field trip in the southern part of the island will follow the meeting.

Venue

Sardinia is the second island in the Mediterranean Sea for extension. Usually celebrated for its beautiful sea and coasts, Sardinia is a land rich in history, tradition and legends with traces of human settlements dated from the Neolithic Age. Located just in the heart of the Mediterranean Sea, rich in mining resources, Sardinia has always represented the colonizers' destination.

Cagliari is the capital city of Sardinia, located in the southern part of the island. Besides its crystalclear sea water and one of the most beautiful and longest beaches in the Mediterranean, Cagliari offers an unspoiled natural environment consisting of lagoons, bird sanctuaries and wildlife reserves which are unique in Europe. The city offers museums and monuments, architecture and archaeological wonders which the different cultures that passed through or occupied Cagliari throughout its history have left behind. The Phoenicians, Romans, and people from Pisa, Genoa, or Spain have all left their mark on this ancient city.

Short geological overview

Sardinia offers the most complete Lower Palaeozoic sequence of Italy with sediments ranging from the Early Cambrian to the Early Carboniferous exposed in the southern part of the island. The Silurian is represented either by calcareous or shaly sediments with two distinct and peculiar facies exposed in the southwestern and southeastern part of the island that mainly resemble the coeval sequences of Bohemia and Thuringia respectively. Their mutual relation is still unclear, but they were likely deposited in different areas of the North Gondwana margin, several dozens of km apart, and joined together by the subsequent Variscan Orogeny. In SW Sardinia, the Silurian-Early Devonian is mainly represented by black shales and relatively shallow-water limestones rich in cephalopods. Strong faunal affinities with Morocco, the Carnic Alps and Bohemia have been demonstrated by several authors,

mainly on the basis of nautiloid cephalopods and bivalves. In SE Sardinia, coeval sediments are represented by the classical Thuringian Triad: “Lower Graptolitic Shales”, “Ockerkalk”, “Upper Graptolitic Shales”. A detailed biostratigraphy for both sequences has been provided owing to their rich conodont and graptolite faunas.

Programme

June 4 arrival of participants and “ice-breaking party”

June 5-7 technical session and ISSS Meeting

June 8-11 field trip

Technical session

The technical sessions and the ISSS Business Meeting will be held in Cagliari. Details will be communicated in the second circular. Any paper dealing with Silurian stratigraphy, palaeoecology and palaeogeography is welcome, but main emphasis will be paid to integrated multidisciplinary approaches to Silurian topics.

Field Trip

Four days of field trip are scheduled after the meeting. The field trip will start and finish in Cagliari. Both limestone and black shale sediments will be accessible in a number of sections and outcrops. Hirnantian and Lochkovian sediments will be shown, too. A couple of historical sites and an old mine will be visited during the excursion. Field trip is limited to 30 participants. Priority will be done to ISSS Titular Members.

Registration and Field-trip costs

Will be communicated in the second circular.

Publications

A proceeding volume will be published after the meeting in an international peer review journal. Details will be communicated as soon as possible in the meeting web-site (www.unica.it/silurian2009) and in the second circular.

Calendar

October 2008 second circular to people who sent the preliminary registration form

31 January 2009 deadline for registration and payment of the registration fee

28 February 2009 deadline for abstracts submission

Trip to Sardinia

Cagliari International airport has daily connections with all major Italian airports, while a few European cities (Paris, London, Bruxelles, ...) are connected a few times a week. Low-cost aircarriers operate regularly from Cagliari to Barcelona, Munich, Stuttgart, Köln, London, etc. However, “new” flights are added constantly, and low cost connections may change year to year, therefore it is impossible to preview the June 2009 connections! Other international airports in Sardinia are located in the northern part of the island: Alghero (210 km to Cagliari) and Olbia (280 km to Cagliari).

Weather

In June the weather is normally good and sunny, with temperatures around 25-30°C. However it may be warmer (mainly during the field trip do not forget the sun cream) and rain cannot be excluded.

Contacts

e-mail contacts: silurian2009@unica.it

web site: www.unica.it/silurian2009



SUBCOMMISSION on
 SILURIAN
 STRATIGRAPHY in
 SARDINIA

Fieldmeeting
 4 - 11 June 2009

Time and life in the Silurian: a multidisciplinary approach

INFORMATION FORM

Name	E-Mail
Institution	Address
City	State/Province
Country	Postal Code
Telephone	Fax

Please indicate participation in conference (erase what not of interest)

possibly probably almost certainly

I will present (erase what not of interest)

oral poster

Preliminary title:

Post-conference field trip (erase what not of interest)

possibly probably almost certainly

I'm interested to publish in the proceeding volume (erase what not of interest)

yes no probably

I agree to list my name and e-mail address on the conference web page as a participant

yes no

Please complete and return by **e-mail to silurian2009@unica.it**

or by mail to

Silurian 2009 c/o Carlo Corradini, Dipartimento di Scienze della Terra, Università di Cagliari
 via Trentino 51 – I-09127 Cagliari (Italy)

SILURIAN RESEARCH in 2007

Dick Aldridge (U.K.): A monograph on Silurian conodonts from South China with Wang Cheng-Yuan edges steadily nearer completion, otherwise my recent activities and publications have mainly focussed on Cambrian and Ordovician Lagerstätte and Permo-Triassic conodonts.

Chris Barnes (Canada): Work with Shunxin Zhang is using my extensive conodont database to relate conodont biostratigraphy, biofacies and biogeography to the pattern of eustasy and tectonism that affected northern Laurentia in the early Paleozoic. Several joint papers have appeared recently with others in press and preparation, which deal with Ordovician and Silurian conodont taxonomy, evolution, paleoecology, analyses and the response of the conodont communities to eustatic change. The geochemistry of Lower Paleozoic conodonts is being pursued further in collaboration with Julie Trotter (Australian National University and CSIRO). Other work in press includes: Late Ordovician-Early Silurian conodonts from the Edgewood Group, Missouri-Illinois (with Tyler Kuhn and Felicity O'Brien). Other work nearing completion includes Ashgill-Wenlock conodonts from the Canadian Arctic with David Jowett.

Denis Bates (U.K.): I am working on a number of retiolitid graptolites, in collaboration with Anna Kozłowska, Alf Lenz and Jörg Maletz. Following publication in 2006, of a paper on the genus *Plectograptus*, genera being worked on include *Holoretiolites* and *Paraplectograptus*. With Anna Kozłowska, a paper on a new retiolitid genus has just been submitted for publication. Work on the ultrastructure of a number of dendroid genera, with Adam Urbanek, is nearing completion. A paper on the ultrastructure, and the stolon system, of *Desmograptus*, with Kate Saunders, Joanne Kluessendorf and Donald Mikulic, has been submitted for publication, and is currently being revised. Work continues on other graptolites, including the Ordovician genus *Cryptograptus*.

Alain Blicek (France): My present research deals mostly with Devonian vertebrates, with some studies of Ordovician and Silurian ichthyofaunas. As concerned with the latter, I am engaged in a collaboration with V.N. Karatajute-Talimaa & Z. Zigaite (Ph. D. thesis on co-tutorial supervision), Vilnius, Lithuania in the course of a French-Lithuanian cooperative project on the Middle Palaeozoic vertebrates of Eurasia, including the Early Devonian agnathans of Severnaya Zemlya, and the late Ordovician and Silurian vertebrates of Lithuania, Siberia, and central Asia.

Olga K. Bogolepova (U.K.): I am actively working on the Cambrian to Devonian biostratigraphy and palaeogeography of the Russian Arctic and Siberia. A paper on the Late Ordovician - Silurian conodonts and stratigraphy of the Severnaya Zemlya Archipelago of Russia (together with P. Mannik, A. Gubanov and A. Poldvere) has been finished and submitted to Geological Magazine.

Carl Brett (U.S.A.): Patrick McLaughlin (now with Wisconsin Geological Survey), Warren Huff (University of Cincinnati) and I, are moving ahead with NSF-funded research on Silurian sequence stratigraphy in eastern Laurentia. We now have detailed logs and correlations of 20 Silurian drill cores and some 50 major outcrops in Ohio, Kentucky and Indiana. These permit a detailed regional sequence stratigraphy for the Llandovery-Wenlock succession in the area of the northern Cincinnati Arch. Work to date indicates that sections on the east side of the Cincinnati Arch in southern Ohio and northern Kentucky can be correlated into New York State, where seven major depositional sequences have already been identified; these correlations are corroborated by new conodont biostratigraphic studies of Mark Kleffner (Ohio State University at Lima).

Likewise, sections to the northwest flank of the Cincinnati Arch, near Dayton, Ohio are now well correlated into Indiana and Louisville, Kentucky and from there into the area of Nashville, Tennessee. The correlations match on the basis of sequence stratigraphy, conodont biostratigraphy and preliminary carbon isotopic stratigraphic results of Brad Cramer (Ohio State University, Columbus).

However, at present, discrepancies exist between sequence- and macrofaunal- based correlations in relation to new biostratigraphic data. The latter suggest major erosion within the lower Wenlock (below the so-called “Laurel” limestone in Ohio, which is clearly not correlative with type Laurel in Indiana) has removed much or all of Sequence V (Irondequoit-Rochester-DeCew of New York and age-equivalent Bisher Formation in southern Ohio), whereas sequence stratigraphy and considerable faunal evidence suggests that this sequence is represented by the “Laurel” of Ohio and equivalent upper Osgood in Indiana. If not, there is a nearly perfect recurrence of older “Rochester-type” biotas in a higher cycle. We are presently gathering additional data with Mark Kleffner, Alyssa Bancroft and Brad Cramer on conodonts and geochemistry to help resolve these issues. New correlations and controversies will be discussed in a guidebook article for the North Central Section of the Geological Society of America pre-meeting field trip to be held April, 22-23, 2008 in southern Ohio and Indiana. We also intend to showcase these sections and the latest results of biostratigraphic, isotopes and sequence stratigraphy at the North American Paleontological Convention to be held, June 21-26, 2009 at the University of Cincinnati.

New K-bentonites have been identified and are being processed. These may also help resolve some contentious correlations. To date we have identified at least two apparent K-bentonite horizons that yield phenocrysts in the upper Wenlock Louisville Formation of southern Indiana and northern Kentucky. In preliminary field studies conducted in late fall 2007 we have located apparently identical horizons in west central Tennessee on the western flank of the Nashville Dome. Another promising clay bed occurs low in the Williamson Shale (Telychian) at Rochester, New York. We have recently located a clay layer in the Telychian Estill Shale from possibly correlative outcrop (conodont biostratigraphy of Mark Kleffner, personally communication) and in drill core both from southern Ohio. Preliminary study of the drill core samples reveals that this 10 cm clay bed indeed has characteristics of expandable-lattice clays. We are continuing to process these samples.

We are working to link with carbon isotopic studies of Brad Kramer and Matt Saltzman at Ohio State University and through this joint work we are moving toward intercontinental correlations with classic sections in Great Britain and Gotland, Sweden.

In addition, I am continuing to work collaboratively with Annalisa Ferretti (Università degli Studi di Modena), Kathleen Histon, and Hans-Peter Schönlaub (Austrian Geological Survey), on combined biostratigraphy and sequence stratigraphy of the Llandovery-Wenlock strata of the Carnic Alps to produce a relative sea-level curve for comparison to eastern Laurentia, Gotland, and Avalonia (see Brett, Ferretti, Histon and Schönlaub, 2007, below).

Mikael Calner (Sweden): I have been doing a lot of teaching and administration lately but will now start working on my research projects again. It’s a bit exciting since I will extend my studies down into the Upper Ordovician as well.

Euan N.K. Clarkson (U.K.): Silurian Fossils of the Pentland Hills, Scotland (edited by Euan N K Clarkson, David A. Harper, Cecilia M. Taylor and Lyall I. Anderson) was published in June 2007, by the Palaeontological Association, Field Guides to Fossils, no 11. Within the 218 pages are 18 chapters, written by various specialists, covering the geology, stratigraphy and palaeoenvironments of the Pentlands Silurian, and life in the Pentlands sea, and there is a separate chapter for each fossil group. There are maps, landscape sketches, sedimentary logs, two coloured paintings, thirty-seven plates, a full bibliography and a systematic index. The abundant fossils, most of which are illustrated here, occur as superbly preserved, undistorted moulds. This guide should be of interest to professional and amateur geologists alike.

Robin Cocks (UK). 2007 was another busy year: the key achievement of which was the submission, revision and acceptance of a Palaeontological Society Monograph reviewing the British and Irish Lower Palaeozoic brachiopods, to be published in 2008. Amongst other papers submitted during the year was one with Richard Fortey on the geological history and origins of Avalonia, and another with Trond Torsvik on the palaeogeography of the Turkey to New Zealand sector of Gondwana and peri-Gondwana in the Cambrian to

Silurian, both to the Geological Society of London. A paper with Leonid Popov on British Silurian linguloids has been accepted by Palaeontology. More palaeogeographical work with Trond is in progress, as well as a revision of Caradoc strophomenoid brachiopods from England and Wales. Apart from the Chinese Ordovician-Silurian Congress and the usual working visits to Trondheim, my travel was somewhat restricted due to three jaw operations.

Carlo Corradini (Cagliari, Italy): I'm working on Silurian and Devonian of North Gondwana, mainly in Sardinia and in the Carnic Alps, and I'm organizing the SSS Field Meeting scheduled in Sardinia in June 2009. In Sardinia my researches are focused on the different Silurian facies cropping out in the island: a project achieving to propose formal stratigraphic units in SE Sardinia is in progress (with E. Serpagli, P. Storch and A. Ferretti), and a study of the graptolite limestones of SW Sardinia, comparing graptolite and conodont faunas, is started (with S. Piras). Furthermore, several Silurian outcrops and sections that will be visited during the SSS 2009 field trip are re-studied. In the Carnic Alps I'm investigating the *Orthoceras* Limestones in the Italian side of the chain, and several sections are in study, mainly in the Lake Wolayer, Mt. Zermula and Mt. Cocco areas (with L. Simonetto, P. Serventi and M. Pondrelli). A paper on the conodont genus *Pseudooneotodus* from Sardinia and the Carnic Alps is in press. The study of a few sections preliminary sampled in the Silurian of the Montagne Noire have just started.

Rein Einasto: I am working on sedimentology, cyclo- and sequence stratigraphy of Baltic O-S in Estonia, based on bed studies of O-S boundary-beds on Middle Estonia boring cores and on one outcrop of the O-S boundary beds in Neitla quarry by Aravete.

Annalisa Ferretti: My Silurian research continues to be concentrated on the biosedimentology and paleoecology of the Austrian Carnic Alps. The work is being carried out together with Kathleen Histon, Hans Peter Schonlaub and Carlton Brett. Rare and problematical phosphatic plates were recently described from the Silurian-Early Devonian of Bohemia (with Enrico Serpagli and Petr Storch) and from the Silurian of the Carnic Alps (with Enrico Serpagli). I am also actually involved, together with Alessandra Negri, Phil Meyers, Petr Storch and Thomas Wagner, in editing a Special Issue of Palaeogeography, Palaeoclimatology, Palaeoecology concerning "Organic carbon rich sediments through the Phanerozoic: Processes, Progresses and Perspectives".

Yngve Grahn: I came back to Brazil and Petrobras in the end of August 2007. My project to achieve an integrated chitinozoan-miospore biostratigraphic framework for the intracratonic basins of Brazil was finished in 2007, and now I continue with more detailed studies. I was also able to do some more work on the Ordovician of Baltoscandia, and recently I submitted a monograph together with Jaak Nõlvak (Tallinn, Estonia). Also this year I have been associated with the post-graduate program at Universidade do Estado do Rio de Janeiro and its geological faculty. Otherwise I am fully occupied with projects for Petrobras.

Olle Hints (Estonia): The focus of my research is on Ordovician and Silurian scolecodonts (polychaete jaws) and other microfossils (chitinozoans, conodonts) and on various problems of regional stratigraphy and geology. In 2007, a global review of Ordovician and Silurian scolecodonts was published together with Mats E. Eriksson (Lund) and other joint projects on Baltic Silurian scolecodonts, especially from the Llandovery and Wenlock, are currently in progress

Kathleen Histon: I have recently obtained a fellowship since the 1st May 2008 with Prof. Annalisa Ferretti at the University of Modena (Italy) to continue working on the Silurian of the Carnic Alps. So, now I am actively working on nautiloid cephalopods from the Carnic Alps (Austria) as part of a multidisciplinary study of prevalently pelagic faunas from the Silurian successions in the Carnic Alps in order to document faunal recovery and exchange during the Silurian and response to eustatic changes on a local scale.

Helen Hughes (U.K.). My PhD research continues on collections of Silurian trilobites from North Greenland. Of particular interest to me are the systematic relationships of the Scutelluidae, certain members of which are proving to be particularly abundant in these reefal limestones. Study continues on the palaeoenvironmental and taphonomic side, concentrating on the identification of trilobite associations, their taphonomic controls, and relationship to lithofacies.

Lennart Jeppsson (Sweden): During 2007 I intended to finish further manuscripts about the interval of the Lau Event and, hopefully, also start with one about the Ansarve Event. Laboratory work and, perhaps, fieldwork will continue as during 2006.

Dimitri Kaljo (Estonia): I am pleased to note that our team (V.Grytsenko, Kiev, T. Martma, M-A. Mõtus and myself) managed to publish the first part of our project about the Silurian of Podolia (see publications). All other projects noted last year are still in progress: the restart of a lab needs much more time than that of a PC. He mentions the possibility to download his publications on their homepage www.kirj.ee/earthsciences
Comments: I would like to make two comments including a belated one as follows:

- a) The questions asked by Philip Legrand are most important because turn our attention to exactness of our stratigraphical language. I do agree that in many cases it should be much better.
- b) I support the conclusions of the Working group led by David Loydell about the Llandovery – Wenlock boundary and GSSP. However, having in mind the 2008 IGC term I would recommend formulate a clear statement by SSS about correlation of the Llandovery-Wenlock boundary level. Besides biostratigraphical data (graptolites, conodonts, chitinozoans, acritarchs etc.) also carbon isotopes are rather instrumental in this case. Recent papers by Cramer & Saltzman (2005), Loydell & Fryda (2007) and our team (Kaljo et al. 2007) demonstrate these possibilities.

Steve Kershaw (U.K.): I continue work on Silurian stromatoporoids and reef complexes.

(1) Recent re-investigation of the relationship between stromatoporoids and their substrates shows that the concept of ragged margins is no longer a reliable indicator of events of sedimentation on stromatoporoids alive on the sea floor. This is because of evidence of primary cavities, principally in Devonian stromatoporoids, but also turning up in Silurian examples. Certain primary cavities are observable on Anticosti (late Llandovery, in conjunction with Andre Desrochers and Bill Ausich), and likely cavities occur in stromatoporoids from Wenlock and Ludlow of Gotland (work with Li Guo and Rachel Wood). This work is being developed with Anne-Christine da Silva (Liege) on Devonian stromatoporoids. Although this work is focused on small-scale features, a knowledge of the relationship between stromatoporoids and their substrates underpins development of understanding the controls on growth of Silurian stromatoporoid-dominated reef complexes. In particular it helps attempts to understanding why Silurian reefs are so densely populated by stromatoporoids in many instances.

(2) With Yue Li (Nanjing) there are two contributions on Silurian reef microfacies, from England and China, in the recent atlas on reef microfacies edited by: Vennin, E., Aretz, M., Boulvain, F and Munnecke, A. 2007. Facies from Palaeozoic reefs and bioaccumulations. Memoires du Museum national d'Histoire naturelle, Tome 195.

(3) A compilation of data on stromatoporoid assemblages from the middle Ludlow Hemse Group of Gotland, with Olof Sandström, revised and resubmitted, shows that the eastern peninsula of Gotland is dominated by stromatoporoid biostromes that have a low diversity assemblage. In each site area, the same species suite occurs, but with different proportions of these species. This suite is probably the best-understood stromatoporoid complex of the Silurian.

(4) I have attempted to contribute stromatoporoid-reef knowledge, in a general way, to the ocean model studies of Jeppsson, Cramer, Saltzman and others, by exploring the formation of the reefs in relation to ocean P & S state models. It seems clear that the most successful stromatoporoid reefs (here I include biostromes if they are appropriately constructed) developed during S-states, which is consistent with the models.

(5) Work on Anticosti reefs began in 2007 with Andre Desrochers and Bill Ausich..

Mark Kleffner (USA). I am actively working on a number of Silurian projects, including: late Wenlock-Ludlow (Silurian) Oceanic Episodes and Events, Southern Laurentia, a collaborative project with James Barrick, Texas Tech University and funded by a National Science Foundation grant; conodont biostratigraphy and $\delta^{13}\text{C}$ chemostratigraphy for the Late Silurian-Early Devonian of western New York with James Barrick, James Ebert, SUNY-Oneonta, and Damon Matteson, SUNY-Oneonta; conodont biostratigraphy and $\delta^{13}\text{C}$ chemostratigraphy for the late Llandovery and Wenlock of Ohio and western New York with Bradley Cramer, The Ohio State University; $\delta^{13}\text{C}$ chemostratigraphy for the Late Ordovician-Early Silurian of the North American Midcontinent, with Stig Bergström, The Ohio State University; and revision of a conodont-, graptolite-, and chitinozoa-based Silurian chronostratigraphy with James Barrick.

Anna Kozłowska (Poland): I am working on retiolitids evolution and other Silurian graptolites mostly from Poland, Arctic Canada, Spain and Lithuania. Polish material comes from boreholes of the East European Platform and Baltic erratic boulders. Collaboration with Denis Bates, Alf Lenz, Sigita Radzevicius, and Sergio Piras.

Jiri Kriz (Czech Republic): I studied in detail the Silurian (Ludlow) sections in the Prague Basin Bohemia together with Stepan Manda from the Czech Geological Survey as the part of our research of the „Environment and the paleo-communities in the Ludlow of the Prague Basin (Perunica, Bohemia)“ – a grant which will be completed in 2008. I am working on the new *Bivalvia* Treatise. I studied the *Bivalvia* dominated communities from the cephalopod limestones of Algeria (Western Hoggar and the Ougarta Range).

Philippe Legrand (France): I prepare a comparison between the lowermost Silurian Algerian graptolite and the lowermost Silurian graptolites of other North African Gondwana countries (Mauretania etc...).

Alfred Lenz (Canada). I am continuing work on Silurian graptolites from Arctic Canada, in full-time collaboration with Ania Kozłowska, and part-time collaboration with Mike Melchin. Current work includes study of a low diversity, mid-Wenlock fauna among which are two very unusual taxa; a second project with Mike Melchin compares and contrasts the morphology of the Telychian *Cochlograptus veles* with the lower Homeric *Testograptus testis*, based on superb, isolated specimens. Most recently I, in collaboration with Ania Kozłowska and Denis Bates, have spent the past three months to more or less complete an updating and compilation of retiolitid taxonomy for the proposed revision of the graptolite part of the Treatise on Invertebrate Paleontology.

Steve LoDuca (U.S.A.): I continue to work on the taphonomy, systematics, functional morphology, paleobiogeochemistry, and evolution of Silurian noncalcified algae, especially dasyclads. Work also continues on the stratigraphy of Silurian units within and adjacent to the Michigan Basin.

Darrel Long (Canada): I am currently continuing my work on the O/S boundary on Anticosti Island in association with Andre Desrochers (University of Ottawa), by compiling multiple sections through the Laframboise member of the Ellis Bay Formation and Fox Point member of the Becsie Formation across the length of the island. In 2007 I published a paper on Anticosti Island.

David Loydell (U.K.): 2007 saw completion of a number of projects, now at various stages in the publication process. Hopefully 2008 will not be as wet in Britain as 2007 (wettest recorded summer!), which will enable fieldwork to continue on some stratigraphically important sections in mid Wales. Work on the Kolka core (with Viiu Nestor and Peep Männik) is nearing completion – another integrated biostratigraphy project which will complement the studies on Ohesaare, Aizpute, etc. already published.

Peep Männik (Estonia). I am actively working on evolution, taxonomy and palaeoecology of conodonts, conodont-based high-resolution stratigraphy, bioevents and palaeogeography. I am also interested in sequence stratigraphy and evolution of sedimentary basins. Starting from this year, I am busy with a 4-year project “Upper Ordovician–Lower Silurian conodont biostratigraphy in stratigraphic sequences” (financed by the Estonian Science Foundation). Also, joint studies together with colleagues from Estonia, Russia, Sweden, U.K. and USA on evolution and high-resolution stratigraphy of the Early Palaeozoic sedimentary basins on Baltica and Siberia palaeocontinents are going on.

Tiiu Märss (Estonia): I am still working on thelodonts. Papers published in 2007 mostly deal with the anatomy and phylogeny of agnathans, and I am sorry to say that no biostratigraphical study was carried out this year. The most important to mention is that together with Susan Turner (Brisbane) and Valentina Karatajūtė-Talimaa (Vilnius) we published the monograph on thelodonts (Märss et al. 2007). It gives a full overview of their research, body morphology, variations and histology of scales, taxonomy, phylogeny and systematics.

Alexander (Sandy) D. McCracken (Canada): I continue to work on Middle to Upper Ordovician, Silurian, Devonian and Carboniferous conodonts from various locations in Canada. Much of my time is now assigned to outreach and paleontological databases.

Patrick I. McLaughlin (USA): During the 2006-2007 academic year I was heavily involved in sequence stratigraphic analysis of Lower Silurian (Llandovery-Wenlock) strata in eastern North America and in Gotland, Sweden. This NSF funded study focused on three areas: the Cincinnati Arch, the northern Appalachian Basin and Gotland, Sweden.

Cincinnati Arch study: See contribution by Carl Brett

Northern Appalachian Basin study:

During April and May of 2007 a total of 28 stratigraphic sections comprising three east-west transects across north-central Pennsylvania, south-central Pennsylvania and northern Maryland were analyzed. These siliciclastic-dominated sections were photo-documented and measured at centimeter-scale. This effort has resulted in approximately 650 meters of measured section and an archive of over 1200 photographs. Additionally, 152 calcareous rock samples were taken from four localities for carbon isotope analysis.

Results of this study agree favorably with Luttrell’s (1968) work and the interpretations of Brett et al. (1990), though some new data suggest that slight modifications are required. Overall this study reinforces the sequence stratigraphic framework of the northern Appalachian Basin and correlations into the Cincinnati Arch, including: 1) The “middle tongue of the Rose Hill Formation”, a condensed quartz granule-rich ironstone succession, is widespread. Its bedding and relationship to surrounding strata shows great similarity to the Waco-Dayton strata of east-central Kentucky and southern Ohio and is interpreted as the transgressive systems tract of sequence IV (sequence terminology of Brett et al., 1990). 2) The “upper Rose Hill”, a 30 m+ shale and siltstone succession, shows shale color alternations between olive-green and maroon nearly identical to the Estill Shale of east-central Kentucky and southern Ohio (climatic/oceanographic signature?) is interpreted as the highstand systems tract of sequence IV. 3) The overlying “lower Keefer Formation”, a heterolithic succession of silty shale, siltstone, sandstone and fossiliferous ironstones (the lower ironstones contain *Paleocyclus* corals), shows three well-developed and widely traceable cycles (each beginning with an ironstone) that can be directly correlated into the Westmoreland-Willowvale-Dawes succession of central New York and is tentatively interpreted as the falling stage systems tract of sequence IV. 4) The “upper Keefer” is a widespread, condensed sandstone bound by ironstones and is correlated into the Kirkland Ironstone of central New York and the basal Bisher Formation of east-central Kentucky and southern Ohio. This unit is interpreted as the transgressive systems tract of sequence V. 5) This “upper Keefer” is overlain by the Rochester Shale, which can be divided into a lower mixed shale and fossiliferous limestone succession and upper shale-rich succession (Lewiston and Burleigh Hill divisions of the Niagara region; highstand systems tract of sequence V). 6) The Rochester Shale is overlain by a thin brachiopod-rich limestone and shale-marlstone succession (*Whitfieldella marylandica* Zone) interpreted as the lateral equivalent to the DeCew Dolostone (falling stage systems tract of sequence V). 7) The overlying McKenzie Formation is found to be divisible into four widely recognizable divisions: a lower shale-marlstone succession with abundant flat-pebble conglomerates, gutter casts and occasional stromatoporoids, a lower,

largely barren, shale-dominated interval, an upper shale-marlstone succession containing highly fossiliferous limestones locally, and an upper, largely barren, shale-dominated succession. These four divisions are tentatively correlated with the Gothic Hill, Pekin, Niagara Falls and Vinemount members within the Lockport Group of New York. (transgressive and highstand systems tracts of sequence VIA and B), 8) The overlying red beds of the Bloomsburg Formation are tentatively correlated with Eramosa Formation of New York and Ontario on the basis of stratigraphic position and as representing an abrupt shallowing.

Gotland, Sweden study:

Field analysis of the late Llandovery to mid Wenlock-age strata along the northwest coast of Gotland, Sweden was completed between August 30th and September 12th. During thirteen days in the field a total of greater than 40 coastal cliff sections were analyzed using a Leica TPS700 total station to rapidly gather highly accurate thickness measurements of facies packages, position of event beds and position and thickness of bioherms. These sections were also photo-documented in great detail yielding more than 1500 new images that were subsequently combined with the thickness data and closely scrutinized at great length to confirm/deny correlations. Additionally, five sections were measured at centimeter-scale to document internal gradients within the facies packages. Guidance through the local geology from colleagues Lennart Jeppsson, Axel Munnecke and Christian Samtleben proved to be invaluable.

The results of this study reveal many new aspects to the geology of the Llandovery-Wenlock boundary interval on Gotland, including: 1) Distinctive phases of Höglint and Tofta bioherm growth are separated by discontinuity surfaces and are tied to specific systems tracts. 2) Both restricted (lagoonal?) and open marine shaly strata occupy a position laterally equivalent to, but not completely synchronous with, the Höglint bioherms. 3) The “Höglint biostrome” abuts the Höglint bioherms at Visby (rather than showing intertonguing, which would suggest outward growth and synchronicity) and these two features are separated by the basal Tofta subaerial unconformity. 4) Further, this surface (i.e. sequence boundary) has been correlated into the Hallshuk section where the Tofta equivalent strata were erroneously correlated with the Höglint (preliminary data suggests that these correlations are supported by a newly revised conodont biostratigraphy; Lennart Jeppsson, personal communication, 2007). 5) Strata of the Svarve section correlate with the middle and upper Tofta of the Hallshuk section. 6) Together the data suggests at least four depositional sequences in the sub-Slite succession. 7) Stable carbon isotope correlation between Gotland and the Niagara region of eastern North America (ref., 2005) suggests that these sequences have their counterparts in the sequences of the Williamson Shale-Eramosa interval (sequences IV-VII) identified by Brett et al. (1990).

Future studies

My plans for the coming year are: 1) To continue to move Silurian high-resolution sequence stratigraphic studies further into the North American continental interior and to strike new collaborations with researchers in this region. 2) To further test sequence stratigraphic correlations in northern Appalachian Basin and Cincinnati Arch through a collaboration with Poul Emzbo of the United States Geological Survey on a project to collect a variety of proxy geochemical data from conodont elements in attempt to identifying major changes in Lower Silurian oceanographic conditions. 3) To begin to generate a web-based data archive of Silurian field data in Wisconsin and adjacent areas.

Michael J. Melchin (Canada): I am currently working on several projects related to graptolite biostratigraphy and biodiversity through the Late Ordovician and Early Silurian, particularly in North America, Europe, and China. My graduate student, Jason Loxton, is completing a study of biodiversity dynamics through the late Katian to early Rhuddanian in Northern Yukon. I am collaborating with Charles Mitchell, David Sheets, Petr Storch and Stan Finney, on the study of Late Ordovician – Early Silurian faunas in Nevada and Bohemia, and Fan Junxuan and Chen Xu (Nanjing) on the study of Rhuddanian-Aeronian graptolites from South China. We are also working together with Chris Holmden and others on the stratigraphy and carbon isotope chemostratigraphy of the same successions. Diane Dawson recently completed her MSc thesis on the phylogeny of some early monograptids and I am continuing phylogenetic studies on other taxonomic groups.

Axel Munnecke (Germany): I am currently working on Ordovician and Silurian palaeoclimatology and chemostratigraphy based on stable carbon and oxygen isotopes, on the origin and diagenesis of limestone-marl alternations, and on Palaeozoic calcareous microfossils. I am co-leader of the IGCP 503 project Ordovician Palaeogeography and Palaeoclimate.

Heldur Nestor (Estonia): Together with Paul Copper and Carl Stock I am completing the monograph on the latest Ordovician and early Silurian stromatoporoids of Anticosti Island, Eastern Canada, that will be published by NRC Research Press, Ottawa.

Viiu Nestor (Estonia): I am actively working on chitinozoan-based high-resolution Silurian stratigraphy. Collaboration with Peep Männik (conodonts) and David Loydell (graptolites) on integrated biostratigraphy of the Kolka core, Latvia is in progress. Joint work on correlation of chitinozoan biozones with Silurian K-bentonites together with Tarmo Kiipli is also underway.

Florentin, Paris (France): Most of my “Silurian activities” are developed within IGCP n° 503 and CIMP/ARAMCO projects. I am supervising a project carried out by Blaise Videt (TOTAL oil company /CNRS contract) on sea-level variations recorded during the Silurian and the Devonian in northern Gondwana regions. Time calibration of the third order cycles and inter-regional correlations are provided by chitinozoans. Beside this work, investigations have been made on Silurian $\delta^{13}\text{C}$ excursions using the chitinozoan vesicles as a carbon source (e.g., Saudi Arabia, Algeria).

Tang Peng (China): As a young researcher working on Ordovician and Silurian chitinozoans and stratigraphy I am involved in a project sponsored by SinoPec, working with Prof. Rong Jia-yu and other researchers. My current work is mainly on Late Ordovician and Early Silurian chitinozoans of China.

Silvio H. Peralta (Argentina): During 2006 Silurian sedimentary rocks of Precordillera have been focused from a tecto-sedimentary point of view. Stratigraphic sections of the Tucunuco Group are under study in the La Invernada and the Alto Arena ranges, on the western flank of the Central Precordillera, but also in the La Dehesa range, between the Talacasto creek and the San Juan River area. Chiefly, significant facies change and correlation studies have been carried out on the Tucunuco Group, formed by the La Chilca Formation (Late Asghill to Early Wenlock) and the Los Espejos Formation (Late Wenlock to Ludlow but also up to Early (basal) Lochkovian in some sections). As result of such studies, important facies changes have been documented to both, La Chilca and Los Espejos Formation, which are related mainly to extensional tectonic activity during Silurian time. On the other side, recently Albanesi and Ortega (2006), described to the middle and upper part of the Los Espejos Formation significant conodont assemblage belonging to *Kokelella variabilis variabilis*, which is recorded in the Ancha creek at the Talacasto area, Central Precordillera. Such conodont zone indicates lower Ludlow (Gorstian) in agree with data provided by Albanesi and Ortega (2006), and it suggests a correspondence with the Linde Event, which occurred between two consecutive stable episodes.

In the La Dehesa range, the Ph.D. student Estela Pereyra carry out stratigraphic and sedimentological studies on the Lower-early Middle Ordovician carbonate of the San Juan Formation and on the overlying Silurian succession of the Tucunuco Group.

On the other side, two students of Geology, Marcelo Ortiz and Mariano Martínez, are carrying out their thesis degree on different Silurian to Devonian section of Central Precordillera. Both sections are believed as key sections to interpret the geometry and tecto-sedimentary evolution of the Silurian basin in Precordillera.

A Project founded by the National University of San Juan, is running from January 2006 to December 2007, involving Early Ordovician carbonates of San Juan Formation, but also siliciclastic Silurian to Devonian marine deposits outcropping on the Eastern flank of the La Invernada Range, on the western side of the Central Precordillera, at San Juan Province. One of the main subject matter of this project is to map the Silurian and Devonian deposits outcropping along the western flank of the La Invernada range, where the recently redefined as Devonian Los Sombreros Formation occurs. This unite has previously been thought as Middle-Upper Ordovician in age, but study developed in last years demonstrate that it is Devonian in age.

(Reference: Albanesi, G. L., Ortega, G. and Hünicken, M. A., 2006. Bioestratigrafía de conodontes y graptolitos silúricos en la sierra de Talacasto, Precordillera de San Juan, Argentina. *Ameghiniana*, v. 43, no 1, pp. 93-112. Buenos Aires).

José Manuel Piçarra (Portugal): I'm actively working on the Lower Paleozoic stratigraphy of South Portugal (Ossa Morena Zone) and also on the Silurian graptolites from Portugal.

I have a project with Juan Carlos Gutiérrez-Marco to study the Silurian of the Galiza-Trás os Montes Zone (Portugal-Spain). I am also working in the Silurian graptolites of the Armorican Massif (a Portuguese-French project with Rémy. Gourvennec, CNRS-Brest).

Sergio Piras (Italy): I'm finishing the first of two years of contract with the University of Cagliari (Sardinia, Italy). My principal research topic are Silurian graptolites of Sardinia. A new lowermost Devonian section in the Upper Graptolitic Shales of SE Sardinia is preliminary investigated; the graptolitic limestones of the Fluminimaggiore area (SW Sardinia) are studied for graptolites and conodonts, in order to compare the two biozonation schemes in the upper Wenlock - Ludlow interval (with C. Corradini); I'm making a revision of the "Gortani graptolites collection" housed in the "Museum Lovisato" at the University of Cagliari. I'm also actively involved in the organization of the field trip of the Subcommittee on Silurian Stratigraphy field meeting 2009 in Sardinia. Furthermore, I'm collaborating with A. Kozłowska for a new genus of retiolitid from lower Ludlow of Bohemia (Czech Republic).

Teresa Podhalańska (Poland): I am working on the Ordovician/Silurian boundary beds, biostratigraphy, microfacies, Hirnantia fauna, Llandovery graptolites and chemostratigraphy related to eustatic changes in the Late Ordovician and the Early Silurian in Poland. I deal with the interpretation of the oxygen and carbon isotope data from the uppermost Ordovician and the lowermost Silurian. Also I am working on Silurian stratigraphy from the deep boreholes of the East European Platform (northern and eastern Poland).

Sigitas Radzevičius (Lithuania): I am actively working on: 1) I am investigating Silurian retiolitids of Lithuania together with Anna Kozłowska (Poland); 2) I am working on late Silurian monograptids together with Adam Urbanek, Lech Teller and Anna Kozłowska (Poland); 3) Me and Tarmo Kipli, Toivo Kallaste (Estonia) are analysing Silurian metabentonites of Lithuania and it's correlation with graptolite zones; 4) I am investigating Silurian graptolites of Lithuania. Currently I am working on Ludlow (Silurian) graptolites from two boreholes; 5) Also I am proceeding investigation on graptolites from erratic boulders taken from Poznan (Poland) vicinities; 6) Me and Pawel Raczyński (Poland) are working on graptolites from Sudet Mountains (Poland).

Rong Jiayu (China) has been studying the Ordovician and Silurian brachiopods mainly from China. Papers were finished or submitted with Jin Jisuo, Zhan Rebin and Jan Bergström on a Hirnantian species of *Stegerhynchus* from the Borenshult Fauna in Sweden; with Tony Wright (Wright and Rong) on a new genus in mid Ashgill of Sweden which is similar to *Brevilamnulella*; with Robin Cocks (Cocks and Rong) on a survey of Rhuddanian brachiopod genera worldwide to determine how and where they picked up after the end Ordovician mass extinction; and with Huang Bing, Zhan Renbin, and David Harper on the latest Ordovician deep water brachiopod assemblage from East China. A paper has been preparing on a lower Rhuddanian brachiopod fauna from Zhejiang and Jiangxi provinces, East China to see survival aspects from the end Ordovician extinction.

Sennikov, Nicolay (Russia): I am working on lithostratigraphy, paleobiogeography and Silurian graptolites from the Altay-Sayan Folded Area and Siberian Platform. At present we are preparing monography "Key Ordovician and Silurian sections of the Gorny Altay (South of West Siberia)". Authors are Sennikov N.V., Yolkin E.A., Obut O.T. et al.

Petr Štorch (Czech Republic): I am continuing with systematic and stratigraphic studies on lower Silurian graptolite faunas of North Africa and peri-Gondwanan Europe. I and Raimund Feist submitted a paper on lowermost Silurian graptolites of Montagne Noire, France (*acuminatus* and *vesiculosus* biozones). Petr Kraft co-authored a paper in press on graptolite fauna and stratigraphy of the Lower Silurian Mrakotin Formation, Hlinsko Zone, NE Bohemian Massif interior. Jiri Fryda have joined me in recent detailed sampling of several lower Silurian black shale sections in the Barrandian area for isotope geochemistry. This high-resolution data will be correlated with graptolite diversity/disparity trends and fluctuations. The project is in progress. Further activities are connected with upcoming ISSS Meeting in Sardinia, 2009. As in late 2006, I have studied Katian and Hirnantian graptolites of Nevada as a Fulbright grantee at California State University, Long Beach (a joint project with Stan Finney, Chuck Mitchell and Mike Melchin).

Desmond Strusz (Australia): I am nearing the end of my revision of the Yass Silurian faunas, operating as a Visiting Fellow at the Australian National University and a Research Associate of the Australian Museum. A paper on representatives of the Superfamily Atrypoidea was published online in October, and in hard copy at the beginning of December, and one on the previously undescribed Superfamily Athyridoidea is due for publication in December in an AAP Memoir dedicated to the late John Shergold. A paper on the also previously undescribed rhynchonellides (there aren't many!) is all but complete, awaiting photography of specimens in the Commonwealth Palaeontological Collection. It is intended to submit this for publication in *Alcheringa*. Work is in progress on the spiriferides.

Completion of the paper on the Spiriferoidea will finish the descriptive work for Yass - I could be persuaded to bring all the biostratigraphy together in a short summary paper dealing also with the local environments and communities. I then intend turning my attention to Silurian faunas from around Canberra.

Thomas J. Suttner (Austria): I am working on Lower and Upper Silurian sections in the NW Himalayas and in Austria (main focus: conodont-biostratigraphy in shallow marine sequences, correlation of reefs and reef related deposits within the early Paleozoic sediments of Austria).

Alan Thomas (U.K.) Alan Thomas is collaborating with Dave Ray on extending their sequence stratigraphic interpretation of the Much Wenlock Limestone Formation at Dudley to cover the Homerian of the Midland Platform. We hope to extend our study further by undertaking collaborative field work with Kathleen Histon and others in the Carnic Alps next summer. Helen Hughes's work on the Greenland trilobites is progressing well. Andrew Story joined us last September. He is researching for a Ph.D. on British Ludlow and Pridoli trilobites, supervised by Phil Lane and me.

Susan Turner (Australia). I am in the process of describing Silurian thelodont scales from Australia and Canada and preparing a UK Special report on microvertebrates with colleagues. With colleagues I have been preparing a celebration of the work of Drs Elga Mark-Kurik and Valentina Karatajute-Talimaa, for a talk given at the joint 10th Early/Lower Vertebrates: IGCP 491 Symposium in Uppsala, last August 2007. A manuscript has been submitted to the symposium volume: Schultze, H.-P., Turner, S. & Grigelis, A. Great Northern Researchers: Discoverers of the earliest Palaeozoic vertebrates (AZ--01-2008-0020) Acta Zoologica.

Thijs Vandenbroucke (Belgium). Whilst my main interest remains focussed on the study of distribution patterns of zooplankton during the Upper Ordovician, I am currently involved in several projects dealing with the Silurian System. (i) Jeremy Davies (BGS), Richard Waters (National Museum of Wales), Stewart Molyneux (BGS), Mark Williams (University of Leicester), Jan Zalasiewicz (University of Leicester), Jacques Verniers (Ghent University), Tom Challands (Durham University) and myself are attempting a critical but constructive revision of the stratigraphy and facies architecture of the Llandovery type area in South Wales, as part of a 2 year (2007-2009) British Geological Survey sponsored project. (ii) Together with Olle Hints (Technical University of Tallinn) and Axel Munnecke (Erlangen University), I am trying to evaluate the differences in carbon isotope values between several groups of palynomorphs, using the Ireviken Event on the Isle of Gotland as a test case. (iii) Furthermore, I hope finish writing up a summary of our chitinozoan work in the Silurian of

the Scottish Pentland Hills together with Maarten Decléene (Ghent University), Jacques Verniers (Ghent University) and Euan Clarkson (Edinburgh University).

Jacques Verniers (Belgium) - I'm still working on the chitinozoans around the Silurian-Ordovician boundary. This year I started processing the Rostanga borehole (Scania, Sweden) where Tania Koren made a detailed graptolite biozonation around the Ordovician-Silurian transition. Most chitinozoan work in our research unit is now on the Ordovician. Jan Vanmeirhaeghe finished his PhD in January 2007 on a revision of the lithostratigraphy and biostratigraphy with chitinozoans of the Ordovician and Llandovery of the Condroz inlier (Belgium). Thijs Vandenbroucke (Belgium) started his post-doc position for three years and will work on chitinozoans in the Upper-Ordovician but only rarely in the Silurian. Two MSc students (Jan Hennissen and Jan Mortier) worked/work on Ashgill–Rhuddanian chitinozoans of respectively Wales (Cwm Hirnant) and the Condroz inlier. Jan Mortier started in October 2007 his PhD study on the lithostratigraphy, biostratigraphy with chitinozoans and palaeoenvironmental reconstruction with isotope studies on organic carbon of the Silurian of the Condroz Inlier (Belgium).

Xu Hong-He (China): My Ph.D dissertation (2006) is *Studies on some herbaceous lycopods from the Hujiersite Formation, late Middle Devonian of North Xinjiang, China*. Besides Devonian plants, I work on spores and phytodebris from the Silurian of South China. Llandovery sedimentary rocks in South China are much better preserved than other series of the Silurian and other parts of China. Investigation of the plant microfossils would shed light on Silurian biostratigraphy and diversity of the early land plants. The bulk maceration has been carried out to some samples. A plenty of microfossils are waiting for a proper time to be worked out.

Evgeny Yolkin (Russia): I am interested in stratigraphy, sedimentology, cyclicity, event stratigraphy, systematics and phylogeny of trilobites. I would like to have a young partner for study Siberian Silurian trilobites (Gorny Altai, Siberian Platform, Central Kazakhstan).

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