NEWSLETTER ON CARBONIFEROUS STRATIGRAPHY

Volume 26 **July 2008**

SCCS

I.U.G.S. SUBCOMMISSION ON CARBONIFEROUS STRATIGRAPHY

Table of Contents

Newsletter on Carboniferous Stratigraphy

Edited by D.M. Work

IUGS SUBCOMMISSION ON CARBONIFEROUS STRATIGRAPHY / VOL. 26 - 2008

CHAIRMAN'S COLUMN

This past year has seen substantially more progress in defining stage boundaries within the Carboniferous System and in identifying more potential candidates for GSSPs. Much of it was a result of the excellent 16th International Congress on the Stratigraphy and Geology of the Carboniferous and Permian Systems [XVI-ICCP] held in Nanjing, China, in June, 2007. Those task group members who were there had ample chance to examine the extensive conodont collections from the roadcut section through the entire Carboniferous at Nashui, southern Guizhou Province, southern China, which were kindly made available by former SCCS member Wang Zhihao and incoming SCCS member Qi Yuping, both of the Nanjing Institute of Geology and Palaeontology. This remarkable section was later visited by participants of Field Excursion C3. At the SCCS meeting at the Congress, discussion focused on the recent selection of the event horizon for the base of the Gzhelian Stage within the Upper Pennsylvanian Series, elections for a new Chair and Vice-Chair of the SCCS, selection of new voting members of the SCCS, and on problems recently discovered with the previously selected GSSP for the base of the Carboniferous System at La Serre, France.

New SCCS Officers

Because both Chair Phil Heckel and Vice-Chair Geoff Clayton have served the ICS-mandated limit of 12 years as voting members of the SCCS, both are stepping down as voting members at the Oslo IGC in August 2008. Balloting carried out in late 2007 resulted in the election of Barry Richards of Canada as the new Chair of SCCS, and of Wang Xiangdong of China as the new Vice-Chair of SCCS (see Secretary's Report). Barry Richards is with the Geological Survey of Canada in Calgary, and is serving as Chair of the Viséan-Serpukhovian Boundary Task Group. Wang Xiangdong is with the Nanjing Institute of Geology and Palaeontology, and was one of the organizers of the 2007 Carboniferous-Permian Congress in Nanjing.

New SCCS Voting Members for 2008-2012

The ICS statutes require that subcommission voting members serve no more than 3 terms [12 years]. Accordingly, six long-serving members will retire at the time of the International Geological Congress in August 2008. Six new members were selected by the executive group [consisting of the Chair and Vice Chair] from a total of 8 nominations received from current members in a process that was made difficult by the excellent qualifications of all nominees. Considerations for selection included research focus on biotic groups that are significant in defining boundaries, geographic familiarity with important regions for boundary selection, stratigraphic familiarity with the part of the succession in which boundaries have yet to be chosen, and support among the continuing members, in addition to the ICS requirements for regional and methodological diversity. We thank the retiring members for their many contributions and long years of service to the SCCS, and we welcome the new members in anticipation of their ongoing contributions to Carboniferous stratigraphy.

Retiring members [with fields of basic expertise] are:

Aleksandr Alekseev, Russia	[conodonts, biostratigraphy]
Geoffrey Clayton, Ireland	[palynomorphs, biostratigraphy]
Philip Heckel, USA	[stratigraphy, conodonts]
Ian Metcalfe, Australia	[conodonts, biostratigraphy]
Nick Riley, UK	[general biostratigraphy]
Elisa Villa, Spain	[fusulinids, biostratigraphy]

New members [with fields of basic expertise] are:

James Barrick, USA	[conodonts, biostratigraphy]
Holger Forke, Germany	[forams, conodonts, biostratigraphy]
Natalya Goreva, Russia	[conodonts, biostratigraphy]
Edouard Poty, Belgium	[corals, sequence stratigraphy]
Qi Yuping, China	[conodonts, biostratigraphy]
David Work, USA	[ammonoids, biostratigraphy]

Status of Boundary Task Groups

This past year has seen much more progress in the selection of stage boundaries, with final selection of one stage boundary GSSP, selection of the marker event for another stage boundary, increasing agreement on the marker event for another stage boundary, and greatly increased focus onto two potential lineages for marker events at nearly the same level for still another stage boundary, as is detailed in the individual reports that follow.

The **Tournaisian-Viséan Boundary Task Group** submitted its GSSP proposal for the base of the Viséan at the first appearance of the foraminifer *Eoparastaffella simplex* in the lineage *E. ovalis – E. simplex* in the Pengchong section near Liuzhou in Guangxi, southern China, to the full SCCS. It has now been approved by the SCCS, and ratified by the ICS and IUGS (see Secretary's Report).

The **Viséan-Serpukhovian Boundary Task Group** has nearly reached agreement that the conodont lineage *Lochriea nodosa – Lochriea ziegleri*, which is widely distributed across Eurasia, will suffice for the boundary marker event, even though it has not yet been discovered in North America. An ammonoid-rich section [Dombar] near the GSSP candidate section in the southern Urals [Verkhnyaya Kardailovka] is undergoing more detailed study for potential correlation with

the ammonoid faunas of the Chainman Shale in western U.S., in order to provide more precise correlation of this level. In addition, several workers are studying conodonts, forams, and corals in various carbonate-dominated sections across the boundary interval in North America and western Europe, to establish a better biostratigraphic framework in order to further bracket the boundary in North America. Another potential GSSP candidate in the Nashui section in southern China is now undergoing more intensive collecting by Chinese and international colleagues, for comparison with the southern Urals candidate.

The **Bashkirian-Moscovian Boundary Task Group** continues more detailed investigation of two conodont lineages, involving the first appearances of *Idiognathoides postsulcatus* and *Declinognathodus donetzianus*. Discovery of the Basu River section with the latter taxon beyond its previously known limits in the southern Urals might make it a potential GSSP candidate. A proposal for considering the first appearance of the apparently more widespread conodont *Diplognathodus ellesmerensis* has engendered much discussion. Although this species generally first appears near the base of the Moscovian in many areas, its general rarity in most sections, its generally small and perhaps mainly juvenile size, and its uncertain evolutionary relationship with other related taxa, would hamper its utility as a marker event. Nevertheless, it is currently used to mark the Moscovian-Bashkirian boundary at the potential GSSP candidate at Nashui in southern China, where Chinese and international colleagues have carried out recent intensive collections of samples for further evaluation of the section.

The combined **Moscovian-Kasimovian and Kasimovian-Gzhelian Boundary Task Group** is examining more closely the taxonomy involved in the conodont lineages that appear useful for boundary recognition, utilizing the correlation chart based on the scales of glacial-eustatic cyclothems plus conodont and fusulinid biostratigraphy, which was published in July 2007. The task group voted in 2007 that the **Kasimovian-Gzhelian boundary** be marked by the first appearance of the conodont *Idiognathodus simulator [sensu stricto]*, which is common in both Eurasia and North America, and this was approved by the entire SCCS in late 2007 (see Secretary's Report). A potential GSSP candidate section for this boundary has been proposed in the marine slope deposits at Usolka in the southern Urals, and the section at Nashui in southern China is another potential GSSP, which will soon undergo more intensive sampling throughout this interval.

As a result of recent intensive conodont work in Midcontinent North America that was presented at a meeting in Oviedo, Spain, in June 2008, the attending task group members voted unanimously to narrow the focus of the event markers for the **Moscovian-Kasimovian boundary** to two related conodont lineages at a level somewhat higher than the current boundary. These are a lineage that includes *Idiognathodus sagittalis*, which was named from the Donets Basin and is known in Eurasia, and the lineage *I. swadei – I. turbatus* [both new species], which are named from Midcontinent North America and are now recognized also in the Moscow region, southern Urals, and Donets Basin. Both potential marker species first appear in the lower part of the regional Russian Khamovnikian Substage, above the current basal Kasimovian regional Russian Krevyakinian Substage, which would then become the top of the Moscovian. Conodonts in the Krevyakinian do not appear to provide a good evolutionary sequence, and although a species sequence in the fusulinid genus *Protriticites* has been proposed for a marker event, experts disagree on its utility. This new position of the Moscovian-Kasimovian boundary will be close to the position of the North American Desmoinesian-Missourian regional stage boundary. Potential GSSPs may be found in the southern Urals, southern Midcontinent North America, and the Nashui section in southern China, which will soon undergo more intensive sampling.

It is worth noting that the Nashui section near Luodian in Guizhou Province in southern China (which was visited on Field trip C3 after the Nanjing Congress), exposes a complete section of Carboniferous marine lower slope deposits extending with no apparent depositional breaks or structural complications from at least mid-Mississippian through the entire Pennsylvanian into the Lower Permian. Preliminary conodont work was published in 2003. Data provided in the field trip guidebook indicate that the thicknesses of the intervals for the Serpukhovian, Bashkirian, Moscovian, and Kasimovian parts of the section are relatively proportional to their estimated durations, thereby supporting the likelihood of continuous deposition. Further detailed work at this section may provide the basis for several GSSP candidates for the remaining stage-boundary stratotypes. Since the Nanjing Congress, several members of the task groups, including Wang Xiangdong, Qi Yuping, Katsumi Ueno, John Groves, Barry Richards, and Rich Lane, have visited parts of the Nashui section with other Chinese colleagues to carry out more detailed sampling for conodonts, forams, chemostratigraphy, and magnetostratigraphy. This is a promising development, because the ICS prefers to see multiple candidates for GSSPs considered seriously before the final choice is made, and the Nashui section ensures that at least two sections will be considered for all remaining Carboniferous stage-boundary GSSPs.

It is also worth noting that the recent progress that has been made in selection and increased focus on fossil lineages for event markers in the two latest stages of the Pennsylvanian was expedited by the framework of biostratigraphic correlation that was recently constructed for that part of the succession. Although construction of that framework was strongly aided by the 'digital' aspects of the cyclothem succession that characterizes that part of the Carboniferous, I would like to take this opportunity to call for experts on the various useful fossil groups in the Mississippian and lower part of

the Pennsylvanian to renew efforts on constructing a tighter framework of correlation for that part of the Carboniferous, utilizing the recent sequence-stratigraphic investigations that are completed or underway.

Joint Task Group for Reappraisal of the Devonian-Carboniferous Boundary GSSP

Because recent restudy of the conodont succession at the D-C boundary stratotype at LaSerre, France [see statement of problem below], has uncovered serious problems with the integrity of the GSSP that was selected there in 1990, the chairs of both subcommissions have each appointed 10 members to a joint task group to reappraise this GSSP.

Members appointed by the Devonian Subcommission:

Thomas Becker, Germany: ammonoids
Denise Brice, France: brachiopods
Carlo Corradini, Italy: conodonts
Brooks Elwood, USA: magnetostratigraphy
Ji Qiang, China: conodonts
Sandra Kaiser, Germany: conodonts, isotope stratigraphy
J. E. Marshall, UK: miospores
Hanna Matyja, Poland: conodonts
Claudia Spalletta, Italy: conodonts
Wang Cheng-yuan, China: conodonts

Members appointed by the Carboniferous Subcommission:

Jim Barrick, USA: conodonts
Paul Brenckle, USA: foraminifers
Geoff Clayton, Ireland: palynomorphs
Jiri Kalvoda, Czech Republic: foraminifers
Rich Lane, USA: conodonts
Svetlana Nikolaeva, Russia: ammonoids
Vladimir Pazukhin, Russia: conodonts
Edouard Poty, Belgium: corals
Barry Richards, Canada: biostratigraphy
Yuan Jin-liang, China: trilobites

Statement of problem recently discovered with the established Devonian-Carboniferous System boundary GSSP at La Serre, France [Summarized from a message from R. Thomas Becker, Chair of the Subcommission on Devonian Stratigraphy]

In 1991, the Devonian-Carboniferous boundary GSSP was placed at the base of bed 89 in artificial trench E' on La Serre hill, coinciding with the first appearance of the conodont *Siphonodella sulcata* above occurrences of *S. praesulcata*, which also accompanies it in bed 89 and above. Recent doctoral work by Sandra Kaiser (currently at Bonn University) supervised by Thomas Becker at University of Muenster, and followed by further sampling and analysis, has shown that there are severe problems with the D-C boundary GSSP at La Serre. The initial project was to re-sample La Serre in order to obtain conodonts that are suitable for oxygen isotopic analysis of conodont phosphate. However, she discovered *Siphonodella* specimens that confirm an old suspicion that the current GSSP level, at the base of Bed 89, is NOT the base of the *S. sulcata* Zone, following the initial proposal on morphometric change from *praesulcata* to *sulcata* in the original contribution by Flajs and Feist (1988), which formed the basis for the GSSP decision at Courtmacsherry. All beds from Bed 85 to 88 have now produced specimens that can readily be identified as *S. sulcata*. Intermediate forms very close to *S. sulcata* (specimens 85/2 and 85/4 in Flajs and Feist 1988) were already published and regarded as belonging to *sulcata* by some conodont workers (discussion at Courtmacsherry meeting, Ziegler and Sandberg 1996, with agreement of Wang Chen-yuan and Ji Qiang of China). Ziegler and Sandberg (1996) also mentioned *Protognathodus kuehnei* as a rare species in the next sample above lateral equivalents of Bed 85; this species is not known from levels older than *S. sulcata* in the few sections with a continuous *Siphonodella* record. In many other sections, *S. sulcata* enters above beds with only *Protognathodus* faunas, and the entry of *P. kuehnei* (defining the Upper *Protognathodus* fauna) within these is currently thought to show the position of the D-C boundary (and not the facies-controlled higher entry of *S. sulcata*). To make the situation even worse, there are also specimens that might belong to *S. duplicata*, the index of the next higher Carboniferous conodont zone, as low as Bed 85. Although these specimens are not well preserved, the situation seems to be as follows:

1. The GSSP level at the base of Bed 89 seems to fall in the upper part of the *S. sulcata* Zone or even already in the *S. duplicata* Zone.

2. The precise zonal assignment at La Serre is hampered by the fact that the beds do not provide high numbers of well preserved siphonodellids, but rather, a lot of reworked conodonts.

3. The GSSP level cannot be correlated with precision into any of the other numerous D-C boundary sections.

4. Point 1 gives a clear correlation of the GSSP level with a level well within (and not below) the *Gattendorfia subinvoluta* ammonoid Zone. As a consequence, *Gattendorfia* would become partly a Devonian genus, which is completely unacceptable to ammonoid workers because of its long tradition of defining the base of the Carboniferous (Oberrödinghausen section of 1937).

5. There is no record of the phylogenetic transition from *S. praesulcata* to *sulcata* at La Serre, which was the main reason why the GSSP was fixed there. Both *praesulcata* and *sulcata* (and intermediates) co-occur jointly in the basal Tournaisian and above a facies break (as in all other known D-C boundary sections). Bed 84 is currently assigned to the Upper *praesulcata* Zone (defined by *P. kockeli*) but does not have a siphonodellid record, as does the same level in many other sections.

There are several ways to resolve the problem:

1) Lower the GSSP level down to the base of Bed 85 at La Serre, which is the simplest solution.

2) Select a new GSSP section, using the same event level.

3) Select a completely new GSSP level, for example the base of the Upper *praesulcata* Zone, where many typical Carboniferous taxa start.

This joint task group will have its first meeting among those attending the International Geological Congress in Oslo this August.

2009 SCCS Meeting in Russia

At the Nanjing Congress, Russian colleagues volunteered to host the 2009 SCCS field meeting in Russia. This meeting will involve visits to the classic sections of Viséan, Serpukhovian, Moscovian, Kasimovian, and Gzhelian strata around Moscow, and sections of Viséan, Serpukhovian, Bashkirian, Moscovian, Kasimovian, and Gzhelian strata in the southern Urals, including candidate sections for the Visean-Serpukhovian boundary GSSP at Verkhnyaya Kardailovka and the Kasimovian-Gzhelian boundary GSSP at Usolka. More detailed information on the localities to be visited and pre-registration information are provided later in this newsletter.

2011 XVII-ICCP in Perth, Australia

Also at the Nanjing Congress, the proposal by Australian colleagues was accepted to host the Seventeenth International Congress on Carboniferous and Permian Stratigraphy and Geology [XVII-ICCP] in Perth, Australia in 2011. More information on this Congress will be forthcoming to all members of the SCCS.

Philip H. Heckel

July 2008

SECRETARY / EDITOR'S REPORT 2007-2008

I want to thank all who provided articles for inclusion Volume 26 of the Newsletter on Carboniferous Stratigraphy and those who assisted in its preparation. I am indebted to P. H. Heckel and B. C. Richards for editorial assistance; and to P. Thorson Work for coordinating the compilation of this issue.

New SCCS Executive

The period for the current SCCS executive expires at the International Geological Congress in Oslo, August 2008. In August 2007, a ballot of voting members was conducted to elect the SCCS nominees to the ICS for the Chair and Vice-Chair for the next four year period 2008-2012. Only single candidates were nominated for Chair, Dr. Barry C. Richards, and Vice-Chair, Dr. Wang Xiangdong. In a secret ballot, both candidates were elected unanimously. Voting Result: Chair (Yes - 17, No - 0, Abstain - 1, No Response - 3); Vice-Chair (Yes - 18, No - 0, Abstain - 0, No Response - 3). Drs. Richards and Wang were subsequently ratified by the ICS as the incoming Chair and Vice-Chair of the SCCS, respectively, for the term commencing at the IGC in Oslo, August 2008.

Ballot on Definition of Kasimovian-Gzhelian Stage Boundary within the Upper Pennsylvanian Series

After several years of deliberation within the Task Group to establish the Kasimovian-Gzhelian boundary, a manuscript draft was provided to its membership in April 2007 supporting the first appearance of the conodont *Idiognathodus simulator* (Ellison, 1941) *(sensu stricto)* as the biostratigraphic criterion upon which to define the base of the Gzhelian Stage. The vote among the 23-member task group was 22 in favor, none against, and one abstention. Accordingly, a formal ballot on the task group's proposed definition of the Kasimovian-Gzhelian boundary was distributed to the voting members of the SCCS in October 2007, which was overwhelmingly approved by the membership. Voting Result: (For - 20; Against - 0; Abstain - 0; No Response - 1). The proposal was therefore adopted, by 100% of the 20 votes cast [which is 95% of the 21 voting members].

Ballot on Selection of Global Stratotype Section and Point (GSSP) for the Base of the Viséan Stage and the Middle Mississippian Series

In November 2007, the Task Group charged with searching for a Global Stratotype Section and Point (GSSP) for the base of the Viséan Stage and the Middle Mississippian Series submitted the following proposal for the approval of the SCCS and IUGS/ICS: "The GSSP for the base of the Viséan Stage should be fixed at the base of bed 83 in the Pengchong section along the bed of a small stream south of the village of Pengchong (24° 26′ N, 109° 27′ E), 15 km N-NE of the city of Liuzhou and about 130 km SW of Guilin in the Guangxi Autonomous Region (South China). This point coincides with the first appearance of the benthic foraminifer, *Eoparastaffella simplex*, in the lineage of '*E. ovalis* group' to *E. simplex*." This proposal had the unanimous approval of the nine members of the task group. Accordingly, a formal ballot on the task group's proposed GSSP for the base of the Viséan Stage was distributed to the voting members of the SCCS, which was unanimously approved by the membership. Voting Result: (For - 21; Against - 0; Abstain - 0; No Response - 0). The ballot result was subsequently ratified by the ICS and IUGS and is binding on the SCCS.

David M. Work

SCCS ANNUAL REPORT 2007

Membership

The Subcommission had 21 voting members in 2007 [see list at end of Newsletter]. In addition, corresponding membership at the time of publication stands at 293 persons and 7 libraries.

Officers

Chair:
Dr. Philip H. Heckel
Department of Geoscience
University of Iowa
Iowa City, IA 52242
U.S.A.
Fax: +1 (319) 335-1821
Email: philip-heckel@uiowa.edu

Vice-Chair:
Dr. Geoffrey Clayton
Department of Geology
Trinity College
Dublin 2
IRELAND
Fax: 3531-6711199
Email: gclayton@tcd.ie

Secretary/Editor:
Dr. David M. Work
Maine State Museum
83 State House Station
Augusta, ME 04333
U.S.A.
Fax: +1 (207) 287-6633
Email: david.work@maine.gov

Task and Exploratory Project Groups

Task Group to establish the Tournaisian-Viséan boundary [which is also the base of the Middle Mississippian Series], chaired by George Sevastopulo of Ireland.

Task Group to establish the Viséan-Serpukhovian boundary [which is also the base of the Upper Mississippian Series], chaired by Barry Richards of Canada.

Task Group to establish the Bashkirian-Moscovian boundary [which is also the base of the Middle Pennsylvanian Series] chaired by John Groves of USA.

Task Group to establish the Moscovian-Kasimovian boundary [which is also the base of the Upper Pennsylvanian Series], chaired by Elisa Villa of Spain. This group is also dealing with the Kasimovian-Gzhelian boundary within the Upper Pennsylvanian Series.

Project Group on Upper Paleozoic boreal biota, stratigraphy, and biogeography, chaired by Marina Durante of Russia.

Project Group on Carboniferous magnetostratigraphy, chaired by Mark Hounslow of United Kingdom.

Chief Accomplishments in 2007 and Early 2008

The GSSP proposal for the Tournaisian-Viséan boundary was approved by the SCCS and ratified by the ICS and IUGS. Work on the Viséan-Serpukhovian, Bashkirian-Moscovian, and Moscovian-Kasimovian boundaries has reached the point where several informal proposals on event markers for those boundaries have been narrowed down to one to three conodont lineages. The remaining proposals are now under intensive investigation and have engendered much further research in several areas on the lineages and also on two to three potential candidates for GSSPs for the remaining boundaries. The event marker for the Kasimovian-Gzhelian boundary at the first appearance of the conodont *Idiognathodus simulator* (Ellison 1941) *[sensu stricto]* was approved by the SCCS.

The Newsletter on Carboniferous Stratigraphy, Volume 25, published in July 2007, contains reports of the task groups for 2006-7 and 3 articles on various topics of interest, including: Afanasievo section, neostratotype of Kasimovian Stage in Moscow Basin of Russia; the Carboniferous research and field conference in Cologne, 2006; and a review of the volumes on the Carboniferous of Germany, for a total of 26 pages.

Work Plan for 2008 and Following Years

The SCCS is looking forward to the 2009 field meeting in Russia, where several potential stage-boundary GSSP candidate sections will be visited in the southern Urals.

Viséan-Serpukhovian boundary. This task group has agreed in principle that the conodont lineage *Lochriea nodosa – Lochriea ziegleri* provides the most likely boundary-defining event, and is focusing work on other biostratigraphically useful fossils across the boundary in areas where this lineage is not yet found. It is evaluating information from potential GSSP candidate sections in the southern Urals and southern China.

Bashkirian-Moscovian boundary. This task group will continue evaluating the proposals for boundary-defining events in the conodont lineages involving the first appearances of *Idiognathoides postsulcatus*, *Declinognathodus donetzianus*, and *Diplognathodus ellesmerensis*, and is initiating serious consideration of potential GSSP candidates in southern China and the southern Urals.

Moscovian-Kasimovian boundary. This task group has resolved several taxonomic issues among conodonts and has voted to narrow the focus for defining the event marker for the boundary onto two conodont lineages at a higher level than the current position in Russia. It will now intensify further work on distribution of these lineages in several regions, including potential GSSP candidate sections in the southern Urals, southern Midcontinent North America, and southern China.

Kasimovian-Gzhelian boundary. The same task group, whose vote on the first appearance of *Idiognathodus simulator [s.s.]* as the boundary-defining event was approved by the SCCS, is now further

evaluating potential GSSP candidates at Usolka in the southern Urals and at Nashui in southern China.

Progress appears to have been sufficient in all task groups, such that the selection of the boundary-defining events for all the remaining stage boundaries in the Carboniferous may be achieved by 2009. However, the strong glacial-eustatic control over sedimentation that resulted in widespread exposure surfaces across entire shelves during the time spanning at least the upper two boundaries is hampering the identification of potentially acceptable GSSPs. Nevertheless, possible candidate GSSPs for several of the boundaries are being further investigated in the southern Urals and southern China.

STATEMENT OF OPERATING ACCOUNTS FOR 2006/2007

Prepared by David Work, Secretary

(Definitive accounts maintained in US currency)

INCOME (Oct. 31, 2006 – Oct. 31, 2007)	
IUGS-ICS Grant 2007	$500.00
Donations from Members	945.00
Interest	9.46
TOTAL INCOME	**$1454.46**
EXPENDITURE	
Newsletter 25 (printing)	$460.12
Postage for bulk mailings	432.19
Mailing/Office Supplies	20.00
TOTAL EXPENDITURE	**$912.31**
BALANCE SHEET (2007 – 2007)	
Funds carried forward from 2005 – 2006	$2669.10
PLUS Income 2006 – 2007	1454.46
LESS Expenditure 2006 – 2007	-912.31
CREDIT balance carried forward to 2008	**$3211.25**

Donations in 2007/2008:

Publication of the Newsletter on Carboniferous Stratigraphy is made possible with generous donations received from members/institutes during 2007-2008 and anonymous donations, combined with an IUGS subsidy of US $500 in 2007, and additional support from a small group of members who provide internal postal charges for the Newsletter within their respective geographic regions.

W. R. Danner, F. R. Ettensohn, E. Grossman, P. H. Heckel, P. J. Jones, M. V. Konovalova, E. I. Kulagina, J. Kullmann, R. H. Mapes, S. V. Nikolaeva, E. Paproth, H. W. Pfefferkorn, J. R. P. Ross, C. A. Ross, W. B. Saunders, R. R. West, T. E. Yancey, and 4 anonymous donors.

COVER ILLUSTRATION

Conodont candidates for marker event for base of global Kasimovian Stage (Upper Pennsylvanian Series).

Illustrations: courtesy of S. J. Rosscoe and J. E. Barrick.

Left: *Idiognathodus turbatus* Rosscoe and Barrick, 2008 [holotype], X70, Mound City Shale, Hertha cyclothem, near Uniontown, Bourbon County, Kansas, U.S.A.

Right: *Idiognathodus sagittalis* Kozitskaya, 1978 [holotype], X70, Limestone O_1, Suite C_3^2, left bank of Lugan' River, Kalinovo village, Donets Basin, Ukraine.

CONTRIBUTIONS TO THE NEWSLETTER

The Newletter on Carboniferous Stratigraphy is published annually (in July) by SCCS. It is composed of written contributions from its members and provides a forum for short, relevant articles such as:

*reports on work in progress and / or reports on activities in your work place

*news items, conference notices, new publications, reviews, letters, comments

*graphics suitable for black and white publication.

Contributions for each issue of the Carboniferous Newsletter should be timed to reach the Editor before 31 May in the year of publication. It is best to submit manuscripts as attachments to Email messages. Except for very short news items, please send messages and manuscripts to my Email address. Manuscripts may also be sent to the address below on CD prepared with **Microsoft Word (preferred)** or WordPerfect but any common word processing software or plain ASCII text file can usually be acommodated. Word processing files should have no personalized fonts or other code. Maps and other illustrations are acceptable in tif, jpeg, eps, or bitmap format. If only hard copies are sent, these must be camera-ready, i.e., clean copies, ready for publication. Typewritten contributions may be submitted by mail as clean paper copies; these must arrive well ahead of the deadline, as they require greater processing time.

Due to the recent increase in articles submitted by members we ask that authors limit manuscripts to 5 double-spaced pages and 1 or 2 diagrams, well planned for economic use of space.

Please send contributions as follows,

AIR MAIL to: David M. Work
Maine State Museum
83 State House Station,
Augusta, ME 04333, USA

EMAIL to: **david.work@maine.gov**

Report of the Task Group to establish a GSSP close to the existing Viséan-Serpukhovian boundary: Summary of progress in 2007-2008 and plans for 2009

Barry C. Richards and Task Group

Geological Survey of Canada – Calgary, 3303 - 33rd St. NW, Calgary, Alberta, Canada T2L 2A7.

During the past year, members of the task group have been involved in numerous activities leading toward the selection of a GSSP for the Viséan-Serpukhovian stage boundary. Richards (2007) presented an overview talk about the boundary at the XVI International Congress on the Carboniferous and Permian, held in Nanjing, China from June 21 to 24. Participants at the session agreed with him that the first evolutionary appearance of the conodont *Lochriea ziegleri* in the lineage *Lochriea nodosa – Lochriea ziegleri*, first recognized by Skompski et al. (1995), presents the best of the known biostratigraphic events for definition of the boundary.

L. ziegleri appears near the middle of the Brigantian Substage, which is slightly below the current base of the Serpukhovian as defined by its type section in the Zaborie quarry near the city of Serpukhov in the Moscow Basin, Russia. The lineage, best documented from relatively deep-water sections, has been identified in several European sections (Nemirovskaya et al., 1994; Skompski et al., 1995), Russia, and China. Most recently, the lineage was located in the Cantabrian Mountains of Spain (Nemyrovska, 2005). The lineage has also been reported from England (Skompski et al., 1995), but its geographic distribution and stratigraphic position in the United Kingdom and Ireland are not well known. In order to better understand its distribution in that important region, task group member Mark Dean (British Geological Survey) is currently investigating the distribution of the lineage in central to northern England and Scotland. Unfortunately, the lineage has not been discovered in North American strata, although several relatively long-ranging species of *Lochriea,* including *L. commutata*, *L. mononodosus* and *L. nodosus,* have been reported (Lane and Brenckle, 2005) but assigned to the genus *Paragnathodus,* a junior synonym of *Lochriea*.

The working group and SCCS have not voted on either rejecting or accepting the first evolutionary appearance of *L. ziegleri* for boundary definition. Until recently, many task group members and other voting members within the SCCS felt that not enough was known about the geographic distribution of the lineage and the degree of diachroneity of the first evolutionary appearance of *L. ziegleri* to warrant a vote. Despite some shortcomings, the first appearance of *L. ziegleri* is a good potential marker for the boundary. Richards plans to prepare a proposal and submit it to the task group and subsequently the SSCS membership for voting on either accepting or rejecting the marker for GSSP definition.

Task group member Yuping Qi and his associates at the Nanjing Institute of Geology and Palaeontology recently recognized the lineage *L. nodosa – L. ziegleri* and other lineages within the *Lochriea* group of species in the Nashui section near the city of Luodian in southern Guizhou province, Peoples Republic of China (Wang and Qi, 2003; Qi and Wang 2005). Qi and Wang have decided to use the first appearance of *L. ziegleri* to define the Viséan-Serpukhovian boundary in southern China. Qi along with several other task group members are currently measuring and sampling additional sections containing the lineage in South China.

During the XVI International Congress on the Carboniferous and Permian, three members of the Viséan-Serpukhovian task group and several other voting members of the SCCS visited the Nashui section on field excursion C3 (Qi et al., 2007). Examination of the section revealed it was highly suitable for the GSSP because it recorded essentially continuous sedimentation across the proposed boundary level in a relatively deep water (lower-slope), well-exposed limestone-dominant succession devoid of structural complications and significant erosion surfaces. At the Nanjing meeting, the group's conodont experts studied the conodont faunas collected across the proposed boundary interval in the Nashui section. They concluded that the conodonts are well preserved and abundant. In addition, they observed abundant elements transitional between *L. nodosa* and *L. ziegleri*. In the collections from Nashui, the oldest representatives of *L. ziegleri* could be readily distinguished from the associated transitional forms of *L. nodosa*.

In the fall of 2007, Qi and colleagues from the Nanjing Institute resampled the Viséan-Serpukhovian boundary interval in the Nashui section on a bed-by-bed basis and processed the samples. During May of 2008, conodont experts Richard Lane, Yuping Qi, and Zhihao Wang meet with Richards in Nanjing to study the recently processed conodont faunas. Several members of the working group, along with John Groves (chairman of Bashkirian-Moscovian task group) and Katsumi Ueno (chairman elect of Moscovian-Kasimovian and Kasimovian-Gzhelian task groups), visited the Nashui section in May, 2008 to complete a detailed biostratigraphic/sedimentologic analysis of that section and a nearby shallow-water (neritic to peritidal) limestone-dominant section near the city of Huishui that also spans the Viséan-Serpukhovian boundary. During the May expedition, John Groves and Katsumi Ueno carefully sampled the section for foraminifers, looking for taxa that could be used to facilitate intercontinental correlation at the level of the *L. nodosa – L. ziegleri* transition.

Nikolaeva et al. (2005) recognized the *L. nodosa – L. ziegleri* lineage in a condensed, relatively deep-water, carbonate section along the Ural River opposite the village of Verkhnyaya Kardailovka on the eastern slope of the southern Urals, southern

Russia. During the SCCS field meeting, which will be held in the Moscow region and southern Urals in the summer of 2009 (see program in this issue of the Newsletter), several members of the working group plan to visit the Verkhnyaya Kardailovka section to determine how that section compares with the one at Nashui in terms of the adequacy of its exposure and depositional continuity. They also plan to restudy the conodont collections from the interval that contains the *L. nodosa – L. ziegleri* lineage.

Svetlana Nikolaeva and her colleagues have expanded their study of carbonate-dominant Viséan-Serpukhovian successions from the Verkhnyaya Kardailovka section to the Dombar Limestone in the nearby Dombar and Kyzl-Shin regions of northern Kazakhstan. In the Dombar Limestone the *Lochriea* lineage occurs with a taxonomically diverse and extremely abundant association of ammonoids (Kulagina et al., 2006; Nikolaeva et al., 2007; Konovalova and Nikolaeva, 2007). The exact position of the ammonoid zones with respect to conodont zones has not been precisely established but work is currently underway to develop such a correlation. The study of ammonoids in the Dombar sections combined with related ongoing work by task group members Alan Titus and Dieter Korn on upper Viséan ammonoids in the Chainman Shale of western Utah and eastern Nevada may lead to a precise ammonoid-based correlation with North America at the proposed level of the Viséan-Serpukhovian stage boundary.

Several task group members, in addition to associate members Sergio Rodriguez (Universidad Complutense in Madrid, Spain) and Wayne Bamber (Geological Survey of Canada-Calgary), are studying various well-exposed carbonate-dominant sections across the boundary interval in the upper Viséan to Serpukhovian Etherington Formation in the southern Canadian Rocky Mountains. Rodriguez and Bamber are preparing a monograph on the taxonomically diverse rugose coral faunas that span the Viséan-Serpukhovian boundary within the Etherington. In conjunction with that work, task group member Bernard Mamet is studying the associated Etherington foraminifers in order to obtain a precise correlation with Eurasian sections containing the *Lochriea* lineage. Conodonts are currently being extracted from samples collected from the Etherington sections and will be studied by task group members.

A multidisciplinary study resembling that of the Etherington project is continuing in Western Europe. In collaboration with D. Vachard and L. Pille (University of Lille), task group member Markus Aretz is working on upper Asbian to Serpukhovian calcareous microfaunas and rugose corals in Morocco, France, Belgium, Germany, and England. It is hoped that through coordination, the western Canadian and European coral/microfaunal projects will lead to the discovery of biostratigraphic markers that can be used to facilitate correlation of the *L. nodosa – L. ziegleri* transition between Europe and North America.

References

Konovalova, V. A., and S. V. Nikolaeva. 2007. Viséan and Serpukhovian ammonoids from the Dombar Limestone, p. 96. *In* Abstracts, XVI International Congress on the Carboniferous and Permian, June 21-24, 2007 Nanjing China, Journal of Stratigraphy 31 (Supplement 1).

Kulagina, E.I., S. V. Nikolaeva, I. Z. Akhmetshina, G. F. Zainakaeva, V. A. Konovalova, V. F. Korbkov, and A. N. Kan. 2006. The Dombar Limestone in the south Urals and the Viséan-Serpukhovian boundary. Newsletter on Carboniferous Stratigraphy, 24:9-11.

Lane, H. R., and P. L. Brenckle. 2005. Type Mississippian subdivisions and biostratigraphic succession, p. 76-105. *In* P. H. Heckel (ed.), Stratigraphy and Biostratigraphy of the Mississippian Subsystem (Carboniferous System) in its Type Region, the Mississippi River Valley of Illinois, Missouri, and Iowa. I.U.G.S. Subcommission on Carboniferous Stratigraphy Guidebook for Field Conference, 8-13 September 2001, St. Louis. Illinois State Geological Survey Guidebook, 34.

Nemyrovska, T. I. 2005. Late Viséan/early Serpukhovian conodont succession from the Triollo section, Palencia (Cantabrian Mountains, Spain). Scripta Geologica, 129:13-89.

Nemirovskaya, T., M.-F. Perret, and D. Meischner. 1994. *Lochriea ziegleri* and *Lochriea senckenbergica* – new conodont species from the latest Viséan and Serpukhovian in Europe. Courier Forschungsinstitut Senckenberg, 168: 311-317.

Nikolaeva, S. V., V. A. Konovalova, L. Z. Akhmetshina, V. F. Korobkov, and G. F. Zainakaeva. 2007. Viséan-Serpukhovian boundary beds of the Dombar Hills (western Kazakhstan), p. 98. *In* Abstracts, XVI International Congress on the Carboniferous and Permian, June 21-24, 2007 Nanjing China, Journal of Stratigraphy, 31 (Supplement 1).

Nikolaeva, S.V., E. I. Kulagina, V. I. Pazukhin, N. A. Kucheva, T. I. Stepanova, N. N. Kochetova, N. B. Gibshman, E. O. Amon, V. A. Konovalova, and G. F. Zainakaeva. 2005. Advances in understanding of the Viséan-Serpukhovian boundary in the South Urals and its correlation. Newsletter on Carboniferous Stratigraphy, 23:27-30.

Qi, Y., and Z. Wang. 2005. Serpukhovian conodont sequence and the Viséan-Serpukhovian boundary in South China. Rivista Italiana di Paleontologica e Stratigrafia, 3:3-10.

Qi, Y., Z. Wang, Y. Wang, K. Ueno and X. Wang. 2007. Stop 1: Nashui section, p. 8-16. *In* Pennsylvanian and Lower Permian carbonate successions from shallow marine to slope in southern Guizhou. XVI International Congress on the Carboniferous and Permian, June 21-24, 2007, Nanjing China, Guide Book for Field Excursion C3.

Richards, B. C. 2007. The Viséan/Serpukhovian boundary – an overview and progress report, p. 99. *In* Abstracts, XVI International Congress on the Carboniferous and Permian, June 21-24, 2007 Nanjing China, Journal of Stratigraphy, 31 (Supplement 1).

Skompski, S., A. Alekseev, D. Meischner, T. Nemirovskaya, M.-F. Perret, and W. J. Varker. 1995. Conodont distribution across the Viséan/Namurian boundary. Courier Forschungsinstitut Senckenberg, 188:177-209.

Wang, Z., and Y. Qi. 2003. Report on the upper Viséan-Serpukhovian conodont zonation in South China. Newsletter on Carboniferous Stratigraphy, 21:22-24.

Report of the Task Group to establish a GSSP close to the existing Bashkirian-Moscovian boundary

John Groves and Task Group

Department of Earth Science, University of Northern Iowa, Cedar Falls, IA 50614, USA.

As reported last year, members of the task group were asked to review Qi et al.'s (2007) proposal for utilizing the appearance of *Diplognathodus ellesmerensis* to characterize the base of the Moscovian Stage. According to Qi et al. (2007), *D. ellesmerensis* appears in evolutionary continuity from *D. coloradoensis* at the base of the Moscovian at the Nashui section in southern Guizhou Province, China. The potential marker taxon is known also from the Bashkirian-Moscovian boundary interval in the Donets Basin, Moscow Syneclise, Spain, northern Europe, Japan, the North American craton and northern South America.

Comments from conodont specialists within the task group centered on three concerns: 1) occurrences of *D. ellesmerensis* are rare; 2) evolutionary relationships among *D. ellesmerensis* and other species in the genus are not adequately known; and 3) most recovered specimens of *D. ellesmerensis* (as well as other congeners) seem to be juveniles, with larger, adult specimens being exceedingly rare. Nevertheless, specialists agree that the appearance of *D. ellesmerensis* in most areas coincides very closely with the base of the Moscovian. Therefore, the proposal merits further evaluation.

Summaries of comments from task group members are provided here:

I. Comments from Lance Lambert

"I do not believe that any species of *Diplognathodus* will serve well to define any GSSP. *Diplognathodus* is a very poorly known genus. Most illustrated specimens are juveniles. Samples with numerous specimens (10s or 100s) commonly yield one or a few specimens that are twice the size of the others, and several times larger than the smallest juveniles. These rare, large specimens have denticulation that is often different from the majority of the specimens (which probably represent earlier ontogeny), and are frequently ornamented on the cup by nodes and/or ridges. The species-level taxonomy within the genus is so poorly known that there is no widely accepted phylogeny. Thus there are no undisputed ancestor-descendent pairs for definition. The paleoecology of *Diplognathodus* is not understood, even at the simple level of 'preferred lithology.' As a consequence, even if a well defined GSSP can be based on *Diplognathodus* at Nashui, there is no rigorous potential for correlation using *Diplognathodus*.

"*Diplognathodus ellesmerensis* probably is the most distinctive species in the genus, but there are too many unanswered questions regarding its frequency (usually very low), its adult morphology, and its ancestry.

"Apart from concerns about *D. ellesmerensis*, the Nashui section is very promising. It has abundant conodonts in the interval of interest. These conodonts are very diverse, including forms that appear to be endemic to the Pacific Rim (a 'western Panthalassan' or 'eastern Paleotethys' aspect), and forms that appear to be common to the European and American regions as well. The exposure is excellent, as is its stratigraphic continuity. The Nashui section certainly warrants further study and consideration.

"*Diplognathodus ellesmerensis* occurs in North America not only in the type Atokan area of southern Oklahoma, as noted by Qi Yuping et al. (2007), but also in the following areas: 1) Hueco Mountains, West Texas, in the zone of *N. atokaensis* and overlying zone of *N.* '*bothrops*' (*sensu* Grayson, 1990); 2) Michigan Basin, in the upper Saginaw Formation assigned to the *N. atokaensis* Zone. (Landing and Wardlaw, 1981); and 3) Alaska, in rocks assigned to the *N. bothrops* Zone (?), but which occur in a suspect terrane.'"

II. Comments from Tamara Nemyrovska

"I understand the difficulties with *Decl. donetzianus* and *Id. postsulcatus* in different areas, and I am glad that there is another proposal.

"*Diplognathodus coloradoensis* and *D. ellesmerensis* are easy to recognize. They have restricted and well-defined stratigraphic ranges. Moreover, the first occurrence of *D. ellesmerensis* is often associated with the appearance of other characteristic species, such as *Declinognathodus donetzianus*, *Idiognathoides postsulcatus*, *Neognathodus nataliae*, and *N.* aff. *atokensis* at the base of the Moscovian (Nemyrovska, 1999; Nemyrovska et al., 1999; Makhlina et al., 2001). It should be noted that the stratigraphic range of *D. coloradoensis* is rather long (more than a stage).

"Nevertheless, the association of *D. ellesmerensis* with several prominent species of *Idiognathoides* and *Idiognathodus* is important. But I am not sure it is a good idea to use *Diplognathodus* species as markers for the Bashkirian-Moscovian boundary, for the following several reasons. I would prefer to have *Diplo. ellesmerensis* as an auxiliary species for characterizing the boundary once its ancestry is better understood.

"The relations between *D. coloradoensis* and *D. ellesmerensis* are not clear. According to von Bitter and Merrill (1990), they belong to different evolutionary branches. Further investigation is necessary to prove that they are relatives.

"They are not generally abundant. They can be numerous, but only sporadically. Usually they are represented by single specimens. Sometimes in one or two samples through the section they can be more numerous, but still much less numerous than the other species in the same sample.

"In the Donets Basin, the FAD of *D. ellesmerensis* is in Lm K_3 (the traditional Bashkirian-Moscovian boundary), its range is lms K_3-K_5 within the limits of the Vereian together with *Idiognathoides sinuatus, Id. donetzianus, Id. marginodosus, Id. tuberculatus, Id. fossatus (ouachitensis), Id. postsulcatus (opimus), Idiognathodus sinuosus, I. aljutovensis, Neognathodus bothrops* and others. The FAD of *Decl. donetzianus* is lower, in

Lm K_1. According to Katsumi Ueno, the typical lower Moscovian foraminiferal fauna starts in K_1.

"In the type Moscovian area, *D. ellesmerensis* occurs as a single specimen in the basal Moscovian beds, just above the FAD of *Decl. donetzianus*.

"Actually the combination *of Decl. donetzianus, Id. postsulcatus* and *Diplo. ellesmerensis* together with the last representatives of the genus *Idiognathoides* mark the beginning of Moscovian, base Bolsovian and mid-Atoka."

III. Comments from Elena Kulagina, Vladimir Pazukhin, and Svetlana Nikolaeva

"Since only a few specimens of the genus *Diplognathodus* are found in the Urals and the southeast of the Russian Platform, it is impossible to use this lineage to mark the base of the Moscovian in these two regions. Here we clearly recognize the base of the Moscovian on the first appearances of the conodont *D. donetzianus* and the fusulinids *Pr. prisca* and *Aljutovella aljutovica*, and one of these would be a more suitable marker in our opinion. These levels we use in our stratigraphic practice now, as they appear to be the best.

"The evolutionary lineage from *Diplognathodus coloradoensis* to *D.ellesmerensis* is as yet not well understood. The appearance of *D. ellesmerensis* from its ancestor is not well constrained stratigraphically by other known conodont lineages, or other groups such as foraminifers and ammonoids. By comparison with the proposed *Diplognathodus coloradoensis – D. ellesmerensis* transition, the fusulinid lineage *Profusulinella – Aljutovella* ex gr. *aljutovica* appears to be more widespread and better studied."

IV. Comments from Elisa Villa and Carlos Méndez

"A couple of specimens morphologically similar to *Diplognathodus ellesmerensis* have been recovered from the Pennsylvanian of the Cantabrian Mountains. One of these specimens was found in a bed at the Las Llacerías section, which, according to fusuline data, is of early Moscovian age. [*Profusulinella sitteri* van Ginkel, a species typical for the lower Vereyan of the Cantabrian Mountains, occurs in the same interval; *Verella* and *Profusulinella prisca* occur slightly higher.] This conodont specimen has been tentatively assigned to *D*. aff. *ellesmerensis*. It differs from typical *D. ellesmerensis* Bender in having better developed denticles in the notch. Unfortunately, a proper comparison is hampered by the scarcity of available material. The same conodont sample yielded *Idiognathodus* aff. *aljutovensis* Alekseev, Barskov, and Kononova, a form ranging from Upper Bashkirian to Lower Moscovian in the Donets Basin and Moscow Syneclise. *Neognathodus atokaensis* Grayson occurs at approximately the same level in a nearby section (less than 500 m away); this species is known from the Atokan in North America and the Lower Moscovian in Eurasia.

"The other *Diplognathodus* specimen could be even closer to *D. ellesmerensis* (it is identified as *D*. cf. *ellesmerensis* in Méndez, 2002). However, its occurrence in the Cantabrian Mountains is not relevant for characterization of the Bashkirian-Moscovian boundary, because it comes from strata that are Podolskian in age on the basis of fusulines.

"The proposal by Qi Yuping et al. (2007) is based on a genus, *Diplognathodus*, whose phylogeny is still poorly known. A tentative phylogeny of this genus, based on North American occurrences, was published by von Bitter and Merrill (1990). It is noteworthy that those authors questionably included *ellesmerensis* in *Diplognathodus*.

"At present, the situation is not satisfactorily resolved, so we should be cautious with the selection of *D. ellesmerensis* as a marker for the Bashkirian-Moscovian boundary. The *D. coloradoensis – D. ellesmerensis* lineage appears to be suitable in the Nashui Section and the Canadian Arctic (Bender, 1980). However, before going ahead, we should know more about the *Diplognathodus* plexus."

References

Qi Yuping, Wang Zhihao, Wang Yue, K. Ueno, and Wang Xiangdong. 2007. Stop 1: Nashui section, p. 8–16. *In* Wang Yue, K. Ueno, and Qi Yuping (excursion leaders), Field Excursion C3, Pennsylvanian and Lower Permian carbonate succession from shallow marine to slope in southern Guizhou. XVI International Congress on the Carboniferous and Permian, Nanjing, China, June 21–24, 2007.

.

Additional Task Group Activities:

Specialists with the Nanjing Institute of Geology and Palaeontology organized an excursion in May (2008) to Guizhou Province to collect additional conodont and foram samples from the Bashkirian-Moscovian boundary interval at the Nashui section, where slope carbonates of probable debris flow origin form a continuous stratigraphic succession. Sampling also was conducted at the Yashui section, a shallow-water equivalent in which micro- and macrofossils are very abundant, and which is punctuated by multiple paleosol horizons. Participants included Wang Xiangdong, Wang Yue, Qi Yuping, Zhang Yi Qiang, He Hong Wei, Wang Jing, Katsumi Ueno, Rich Lane, John Groves and incoming SCCS Chair Barry Richards.

Demir Altiner has completed a study of foraminifers from the Bashkirian-Moscovian boundary interval at four sections in the Yaricak Yayla area of the Aladag Allochthon, southern Anatolide-Tauride Block, Turkey. Foraminiferal biostratigraphy has been intergrated with high resolution sequence stratigraphy. Conodonts from the same sections are being examined by doctoral candidate Ayse Atakul. The base of the Moscovian Stage in the Yaricak Yayla area is recognized on the appearances of *Profusulinella prisca* and *Aljutovella aljutovica* within transgressive- and highstand depositional systems tracks. This boundary also falls immediately below the extinction of the superfamily Archaediscacea, including *Asteroarchaediscus baschkiricus* and other asteroarchaediscids.

Progress Report of the Task Group to establish the Moscovian-Kasimovian and Kasimovian-Gzhelian boundaries

Elisa Villa and Task Group

Depto de Geología Universidad de Oviedo, Arias de Velasco s/n 33005 Oviedo, Spain.

In the last few years, the search for fossil markers to establish worldwide correlation in the upper part of the Pennsylvanian Subsystem has led to important progress. Meetings and discussions undertaken by the task group to establish the Moscovian-Kasimovian and Kasimovian-Gzhelian boundaries enabled achievement of considerable improvement in correlation across both boundary intervals and, ultimately, to the proposal that the level at which the conodont species *Idiognathodus simulator* (Ellison, 1941) [sensu stricto] first appears be selected to mark the base of the global Gzhelian Stage.

Task Group Activities in 2006

A detailed report dealing with the 2006-2007 achievements of this task group (briefly summarized by Villa and Task Group, 2007) was presented by SCCS Chairman and task group member P. H. Heckel during the SCCS meeting at the XVI- ICCP in Nanjing, China. At that time, it was announced that the SCCS had voted unanimously in late 2007 to accept the task group's proposal for establishing the conodont *Idiognathodus simulator* (Ellison, 1941) [*sensu* Barrick et al., 2004; see Barrick et al., 2008] as the event marker for the base of the global Gzhelian Stage, and this level is now indicated on the ICS website www.stratigraphy.org/gssp.

Redescription of *I. simulator* with elaboration of its distinctions from its predecessors and other closely related species is now in press with *Micropaleontology* (Barrick et al., 2008). Detailed characterization of the Kasimovian-Gzhelian boundary interval is scheduled to be published in *Episodes* later this year (Heckel et al., 2008), and the official task group report has been submitted by Villa and others to the reports of the Nanjing Congress. Further work is underway on potential GSSP candidates at Nashui in southern China, and at Usolka in the southern Urals of Russia (see Davydov, 2008).

The task group has now begun to refocus efforts on the interval embracing the Moscovian-Kasimovian boundary interval, where provincialism of the Pennsylvanian biotas was particularly strong, and consequently, the search for a widely distributed fossil marker became a difficult task. Much work that commenced in the 1990s has been devoted to analyzing the fossil content (mainly conodonts and fusulinids) in sections distributed worldwide, trying to identify common forms and common evolutionary trends estimated to occur at essentially synchronous times. Fortunately, the huge amount of data compiled in the last several years has begun to provide fruitful results. The biostratigraphic knowledge gathered from these studies has been inserted into a cyclothem-based stratigraphic framework, resulting in a correlation of the major cyclothems between North America and eastern Europe (Heckel et al., 2007). Taxonomic and zonational updating of the conodont faunas in eastern Europe (e.g., Goreva and Alekseev, 2006; Alekseev and Goreva, 2007; Goreva et al., 2007), and in Midcontinent North America (Rosscoe and Barrick, 2008, in press) has formed the basis for welcome progress at the most recent task group workshop and general meeting in the University of Oviedo (Spain), in June 2008. This meeting was attended by task group members J. Barrick, H. Forke, N. Goreva, P. Heckel, T. Isakova, O. Kossovaya, L. Lambert, M. L. Martínez Chacón, C. Méndez, T. Nemyrovska, L. C. Sánchez de Posada, K. Ueno, and E. Villa, and collaboraters J. Bahamonde, S. Blanco, O. Merino-Tomé, M. Novak, S. Rosscoe, and J. Sanz.

At this meeting, several days of examination of conodonts and excellent SEM illustrations from North America, Russia, Ukraine, and Spain resulted in the recognition that species newly described from North America occur also in the Moscow region, the southern Urals, and the Donets Basin. These discoveries further resulted in the narrowing of focus in the task group onto two conodont taxa in an interval within the lower Khamovnikian Substage, as indicated in the next paragraph. This interval is above the current base of the Kasimovian Stage at the base of the Krevyakinian Substage, which is marked by a widespread disconformity. A problem within the Krevyakinian is that the evolutionary succession of conodont species seems to be more obscure than in the lower Khamovnikian. Regarding fusulinids, although the transition from primitive to advanced *Protriticites* has been proposed to define the boundary (Davydov, 2007), the criteria involved are believed by other experts to be hampered by fusulinid provincialism, diachroneity, and problems of preservation. Also, the potential new, higher base of the Kasimovian would be closer to an earlier level of the base of the Kasimovian at the first appearance of the fusulinid *Triticites* [=*Montiparus*] (see Isakova et al., 2005).

Task Group Recommendations on the Event Marker for the Moscovian-Kasimovian Boundary

The members of the Task Group on the Moscovian-Kasimovian Stage Boundary who attended the 2008 Oviedo meeting reached unanimous agreement to focus future work on two species of conodonts as the potential biostratigraphic marker by which the level of the base of the Kasimovian Stage can be selected and correlated globally:

1) *Idiognathodus sagittalis* Kozitskaya, 1978, based on material from the Donets Basin (Ukraine), has been identified also from the Moscow Region and southern Urals (Russia), and the Cantabrian Mountains (Spain). A possible ancestor-descendent lineage from *I. nikitini* n. sp. to *I. sagittalis* may be present in the Moscow Region.

2) *Idiognathodus turbatus* Rosscoe and Barrick, 2008 (*I.* n. sp. A of Barrick et al., 2004), based on material from Midcontinent North America, has been recognized also in the Moscow Region, the southern Urals, and the Donets Basin. A lineage from *Idiognathodus swadei* Rosscoe and Barrick, 2008 to *I. turbatus* has been described from Midcontinent North America.

The first appearance datums (FADs) of *I. sagittalis* and *I. turbatus* appear to lie close to each other in time, hence the

presence or absence, along with stratigraphic positions of the FADs of both species**,** need further investigation in all regions for identification of potential GSSP candidates. The distributions of other faunal groups relative to the FADs of these conodont species also need to be determined. Based on preliminary information, the following regions and stratigraphic levels will be further investigated: Moscow region (Basal, Lower, and Middle Neverovo Formation); Donets Basin (Limestones N_5, N_5^1, and O_1); southern Urals (Kurkin Formation); Midcontinent North America (Exline to Hertha cyclothems); Carnic Alps (Basal Auernig Formation); Cantabrian Mountains (Las Llacerias Formation); and southern China (appropriate intervals in the Nashui and Zhongdi sections).

All known FAD levels of *Idiognathodus sagittalis* and *I. turbatus* and, thus, the potential base of the Kasimovian, lie above a major stratigraphic break (major sequence boundary) that has been recognized at most sections. The FADs of both conodont species lie within the early transgressive portion of a composite stratigraphic sequence, above the unconformity that defines the sequence boundary. Below this sequence boundary are the extinction levels of the conodonts *Neognathodus* and *Swadelina*, and the fusulinid *Beedeina*. The FAD of the fusulinid *Fusiella rawi* lies close to the sequence boundary. Above the sequence boundary occur the FADs of the fusulinid *Montiparus* and the ammonoid *Pennoceras*. Hence both conodont candidates are supplemented by other readily recognized changes in conodonts and other biostratigraphically useful fossil groups

Coming Steps

A new period within the task group will commence after August 2008. Following that date, the present task group leader will step down and will be replaced by a new coordinator, Katsumi Ueno of Fukuoka University, Japan. Among the goals that the task group will face in the future, the most important will be the proposal and acceptance of the fossil marker for the global lower Kasimovian boundary, and the selection of GSSPs for both the lower Kasimovian and lower Gzhelian boundaries.

References

Alekseev, A. S., and N. V. Goreva. 2007. Conodont zonation for the type Kasimovian and Gzhelian stages in the Moscow Basin, Russia, p. 229-248. *In* Th. Wong (ed.), Proceedings of the XVth International Congress on Carboniferous and Permian Stratigraphy. Royal Netherlands Academy of Arts and Sciences, Amsterdam.

Barrick, J. E., L. L. Lambert, P. H. Heckel, and D. R. Boardman. 2004. Pennsylvanian conodont zonation for Midcontinent North America. Revista Española de Micropaleontología, 36:231-250.

Barrick, J. E., P. H. Heckel, and D. R. Boardman. In press [2008]. Revision of the conodont *Idiognathodus simulator* (Ellison 1941), the marker species for the base of the Late Pennsylvanian global Gzhelian Stage. Micropaleontology, 54 (2).

Davydov, V. I. 2007. *Protriticites* foraminiferal fauna and its utilization in the Moscovian-Kasimovian boundary definition, p. 457-466. *In* Th. Wong (ed.), Proceedings of the XVth International Congress on Carboniferous and Permian Stratigraphy. Royal Netherlands Academy of Arts and Sciences, Amsterdam.

Davydov, V. I., V. V. Chernykh, M. Schmitz, W. S. Snyder, and B. I. Chuvashov. 2008. Faunal assemblage and correlation of Kasimovian-Gzhelian transition at Usolka section, southern Urals, Russia (a potential candidate for GSSP to define base of Gzhelian Stage). Stratigraphy, 5(2):113-136.

Goreva, N. V., and A. S. Alekseev. 2006. New conodont species from the Kasimovian Stage (Upper Carboniferous) of Moscow and Moscow Basin. Paleontological Journal, 40:193-197.

Goreva, N. V., A. S. Alekseev, T. N. Isakova, and O. L. Kossovaya. 2007. Afanasievo Section – neostratotype of Kasimovian Stage (Upper Pennsylvanian Series), Moscow Basin, central Russia. Newsletter on Carboniferous Stratigraphy, 25:8-14.

Heckel, P. H., A. S. Alekseev, J. E. Barrick, D. R. Boardman, N. V. Goreva, T. I. Nemyrosvka, K. Ueno, E. Villa, and D. M. Work. 2007. Cyclothem ["digital"] correlation and biostratigraphy across global Moscovian-Kasimovian-Gzhelian Stage boundary interval (Middle-Upper Pennsylvanian Series) in North America and eastern Europe. Geology, 35:607-610.

Heckel, P. H., A. S. Alekseev, J. E. Barrick, D. R. Boardman, N. V. Goreva, T. N. Isakova, T. I. Nemyrosvka, K. Ueno, E. Villa, E., and D. M. Work. In press [2008]. Choice of conodont *Idiognathodus simulator [sensu stricto]* as the event marker for the base of the global Gzhelian Stage (Upper Pennsylvanian Series, Carboniferous System). Episodes, 31.

Isakova, T. N., A. S. Alekseev, N. V. Goreva, and O. L. Kossovaya. 2005. Lower Kasimovian (Pennsylvanian) of Donskaya Luka (southern Russia). Newsletter on Carboniferous Stratigraphy, 23:44-47.

Rosscoe, S. J., and J. E. Barrick. In press [2008]. Revision of *Idiognathodus* species from the Middle-Upper Pennsylvanian boundary interval in the Midcontinent basin, North America. Paleontographica Americana.

Villa, E., and Task Group. 2007. Progress report of the Task Group to establish the Moscovian-Kasimovian and Kasimovian-Gzhelian boundaries. Newsletter on Carboniferous Stratigraphy, 25:7-8.

Villa, E., A. S. Alekseev, J. E. Barrick, D. R. Boardman, A. Djenchuraeva, B. Fohrer, H. C. Forke, N. V. Goreva, P. H. Heckel, T. N. Isakova, O. L. Kossovaya, L. L. Lambert, M. L. Martínez Chacón, C. Méndez, T. I. Nemyrosvka, S. Remizova, E. Samankassou, L. C. Sánchez de Posada, K. Ueno, G. P. Wahlman, and D. M. Work. Selection of the conodont *Idiognathodus simulator* (Ellison) as the event marker for the base of the global Gzhelian Stage (Upper Pennsylvanian, Carboniferous). Submitted to Reports of the XVI Congress on the Carboniferous and Permian, Nanjing 2007.

Views and interpretations expressed / presented in
contributions by members are those of individual authors / co-authors
and are not necessarily those of the SCCS and carry no formal SCCS endorsement.

Foraminifer-based correlation of the Chesterian Stage in the Mississippian type region, Illinois, USA with the Serpukhovian Stage of Russia

E. I. Kulagina[1], N. B. Gibshman[2], and S. V. Nikolaeva[3]

[1]Institute of Geology, Ufa Research Center, Russian Academy of Sciences, K. Marksa, 16/2, Ufa 450000, Russia.

[2]Russian University of Oil and Gas. Dept. Geology, Leninsky Prospekt, 65, Moscow 117868, Russia.

[3]Paleontological Institute, Russian Academy of Sciences, Profsoyuznaya, 123, Moscow 117647, Russia.

Introduction

The foraminifer-based correlation of the type Chesterian Stage of the Mississippi Valley with the type Serpukhovian Stage of the the Russian Platform still remains a subject of discussion. Identifications and ranges of the key foraminiferal taxa are debatable, and there is no agreement on correlation of beds around the Viséan-Serpukhovian boundary. In Europe, the Moscow Basin, and the Urals, the base of the Serpukhovian is more or less reliably defined by the appearance of the conodont *Lochriea ziegleri* which is accompanied by a notable change in the ammonoid assemblages (appearance of *Cravenoceras* faunas) and the first appearance of the foraminifers *Neoarchaediscus postrugosus* and *Eolasiodiscus*. However, the *Lochriea* lineage has not been identified in North America, which makes intercontinental correlation of this level highly problematic, even though the definition and correlation of the base of the Serpukhovian has been identified as a high priority task of the International Subcommission on Carboniferous Stratigraphy. During a Carboniferous Subcommission excursion to the type Mississippian during September 8-13, 2001 (Heckel, 2001; Brenckle et al., 2005), several Chesterian sections were sampled for foraminifers for an overview of the distribution of key foraminiferal taxa. The samples were processed in Russia, which provided an opportunity to compare North American and Russian foraminiferal faunas from the late Viséan into the Serpukhovian.

Material

Kulagina and Gibshman collected 29 Chesterian samples (Fig. 1), from which about 100 1.5 x 1.5 cm thin sections were prepared. Only 14 samples contained foraminiferal assemblages that could be compared with those from the Serpukhovian stratotype and reference sections in the Moscow Basin and in the Urals (Gibshman, 2001, 2003; Kulagina et al., 2003; Nikolaeva et al., 2001, 2005).

Results from Chesterian Thin Sections

Genevievian Stage

Falling Springs quarry: Upper part of Ste. Genevieve Limestone (Brenckle et al., 2005, fig. 29, Stop 9B)

Sample 20 (3) [number of thin sections from sample is shown in parentheses]. Oolitic grainstone without foraminifers.

Sample 21 (1). Microbioclastic packstone-wackestone with rare foraminifers *Paraarchaediscus koktjubensis* (Rauzer-Chernousova), *Asteroarchaediscus* cf. *parvus* (Rauzer-Chernousova), *Neoarchaediscus* sp.; similar assemblage indicated in Brenckle et al. (2005, p. 32). These taxa appear in the upper Viséan in the Russian Platform and the Urals and range into the Serpukhovian.

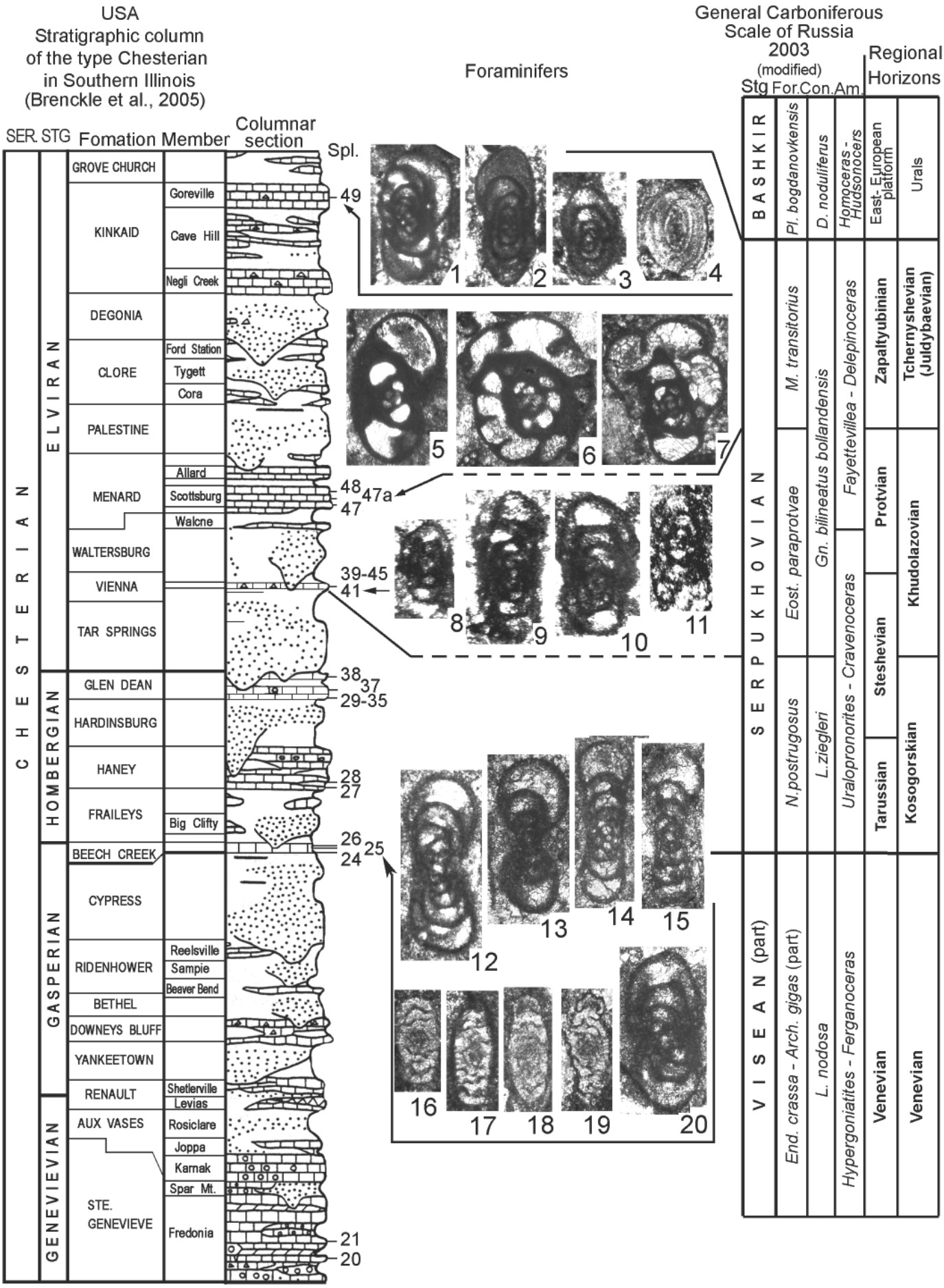
Gasperian Stage

Modoc South: Beech Creek Limestone (Brenckle et al., 2005, fig. 32, Stop 12). Four samples were taken from the Beech Creek Limestone (about 15 m thickness).

Sample 24 (2). Bryozoan-crinoidal oolitic packstone with rare *Pseudoglomospira* sp., *Asteroarchaediscus parvus* (Rauzer-Chernousova).

Sample 25a (3). Oolitic grainstone-packstone with *Endothyra* sp., *Zellerinella discoidea* (Girty), "*Millerella"* sp., *Neoarchaediscus postrugosus* (Reitlinger), *Asteroarchaediscus* ex gr. *rugosus* (Rauzer-Chernousova).

Fig. 1. Correlation of Chesterian foraminiferal assemblages with biozones of the General Carboniferous Scale of Russia (Kagarmanov and Kossovaya, 2003) and regional stages. *1, Plectostaffella* ex gr. *varvariensis* (Brazhnikova and Potievska, 1948), x 70, spl. 49-2; *2, Eostaffella* ex gr. *pseudostruvei* (Rauser-Chernousova et Beljaev, 1936), x 70, spl. 49-2; *3, Eostaffellina* aff. *paraprotvae* Rauser-Chernousova, x 65, spl. 49-3; *4, Brenckleina rugosa* (Brazhnikova, 1964), spl. 49-7, x 80; *5, 6, Endothyra* ex gr. *bowmani* Phillips, 1846, *5*, x 55, *6*, x 40, spl. 47-3; *7, Endothyra* ex gr. *phrissa* (D. Zeller, 1953), x 55, spl. 49-2; *8, Eostaffellina* aff. *decurta* (Rauser Chernousova, 1948), x 90, spl. 41-1; *9, 20, "Millerella tortula"* D. Zeller, 1953, *9*, x 80, spl. 41-4, *20*, x 100, spl. 25-2; *10, Eostaffellina* cf. *cooperi* (D. Zeller, 1953), x 80, spl. 41-7; *11, Eostaffella* ex gr. *postmosquensis* Kireeva, 1951, x 80, spl. 41-6; *12, 13, "Millerella*" spp., x 100, spl. 25-2; *14, Zellerinella discoidea* (Girty, 1915), x 80, spl. 25-4; *15,* (?) *Loeblichia* sp. x 80, spl. 25-2; *16, Asteroarchaediscus rugosus* (Rauser-Chernousova, 1948) x 115, spl. 25-2; *17, Asteroarchaediscus parvus* (Rauser-Chernousova, 1948), x 115, spl. 25-3; *18-19, Neoarchaediscus postrugosus* (Reitlinger, 1949), x 115, *18*, spl. 25-3, *19*, spl. 25- 4.


USA
Stratigraphic column
of the type Chesterian
in Southern Illinois
(Brenckle et al., 2005)
SER. STG
Fomation Member
Columnar section
Foraminifers
Spl.
General Carboniferous
Scale of Russia
2003
(modified)
Stg For.Con.Am.
Regional
Horizons
CHESTERIAN
ELVIRAN
HOMBERGIAN
GASPERIAN
GENEVIEVIAN
GROVE CHURCH
KINKAID
Goreville
Cave Hill
Negli Creek
DEGONIA
CLORE
Ford Station
Tygett
Cora
PALESTINE
MENARD
Allard
Scottsburg
Walcne
WALTERSBURG
VIENNA
TAR SPRINGS
GLEN DEAN
HARDINSBURG
HANEY
FRAILEYS
Big Clifty
BEECH CREEK
CYPRESS
RIDENHOWER
Reelsville
Sampie
Beaver Bend
BETHEL
DOWNEYS BLUFF
YANKEETOWN
RENAULT
Shetlerville
Levias
AUX VASES
Rosiclare
Joppa
Karnak
Spar Mt.
STE. GENEVIEVE
Fredonia
49
48
47a
47
39-45
41
38
37
29-35
28
27
26
24
25
21
20
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
BASHKIR
SERPUKHOVIAN
VISEAN (part)
Pl. bogdanovkensis
M. transitorius
Eost. paraprotvae
N.postrugosus
End. crassa - Arch. gigas (part)
D. noduliferus
Gn. bilineatus bollandensis
L.ziegleri
L. nodosa
Homoceras - Hudsonoceras
Fayettevillea - Delepinoceras
Uraloprononites - Cravenoceras
Hypergoniatites - Ferganoceras
East- European platform
Urals
Zapaltyubinian
Tchernyshevian (Juldybaevian)
Protvian
Steshevian
Khudolazovian
Tarussian
Kosogorskian
Venevian
Venevian

Sample 25 (6). Foraminifer-bioclastic, lithoclastic packstone with *Endothyra* sp., "*Millerella"* sp., "*M." tortula* D. Zeller, *Zellerinella discoidea* (Girty) – numerous, (?)*Loeblichia* sp., *Asteroarchaediscus rugosus* (Rauzer-Chernousova), *A. parvus* (Rauzer-Chernousova), *Neoarchaediscus postrugosus* (Reitlinger).

Sample 26 (10). Bryozoan-crinoidal grainstone with ostracodes and foraminifers: *Earlandia* sp., *Endothyra prisca* Rauzer-Chernousova and Reitlinger, *Zellerinella* sp., *Paraarchaediscus stilus* (Grozdilova and Lebedeva), *Asteroarchaediscus rugosus* (Rauzer-Chernousova), A*. parvus* (Rauzer-Chernousova), *Neoarchaediscus* ex gr. *probatus* (Reitlinger).

Hombergian Stage

Old Randolph Stone Company quarry at Roots: Haney Limestone (Brenckle et al., 2005, fig. 33, Stop 13).

Sample 27. Pelmatozoan-bryozoan boundstone and packstone.

Sample 28 (10). Pellet-pelmatozoan-bryozoan packstone with ooids, with very rare foraminifers of small size: *Endothyra prisca* Rauser-Chernousova and Reitlinger, *Endostaffella parva* (Möller), *Mediocris breviscula* Ganelina, *Betpakodiscus aliminimus* Brenckle, *Neoarchaediscus* cf. *postrugosus* Reitlinger, *Planospirodiscus* sp., *Asteroarchaediscus* sp.

Coles Mill at Chester: Glen Dean Limestone (Brenckle et al., 2005, fig. 34, Stop 14). This limestone (8.2 m thickness) was sampled the most closely of all the formations.

Samples 29-31. Pelmatozoan-bryozoan wackestone-packstone and fine-crystalline dolomite with relict bryozoans. There is a single specimen of the foraminifer *Endostaffella* (?) sp. in sample 31(3) and numerous *Earlandia moderata* (Malakhova) in sample 29 (2).

Sample 32 (2). Crinoid-bryozoan grainstone with *Neoarchaediscus* cf. *probatus* (Reitlinger), *Planospirodiscus* sp.

Samples 33-38. Bryozoan grainstone with pelmatozoans and gastropods, and some ooids. Single specimens of *Endothyra* sp., *Planoendothyra* (?) sp., "*Millerella* "(?) sp. are present in sample 36 (3).

Elviran Stage

Grantsburg Northeast railroad cut: Vienna Limestone (Brenckle et al., 2005, fig. 35, Stop 15). Samples 39-45 were taken from the Vienna Limestone (5.5 m thickness).

Sample 39 (6). Bryozoan-crinoid grainstone with brachiopods, *Scalebra* sp.; foraminifers: *Globoendothyra* sp., *Planoendothyra* sp., "*Millerella"* cf. *tortula* D. Zeller, *Endothyra* ex gr. *kentuckyensis* (D. Zeller), *Semiendothyra* (?) sp., *Asteroarchaediscus baschkiricus* (Krestovnikov and Theodorovich).

Sample 40 (1). Microcrystalline dolomite with relict bryozoans.

Sample 41 (10). Bryozoan-crinoid grainstone-rudstone, with brachiopods and foraminifers: *Endothyra* sp., *Eostaffellina* ex gr. *paraprotvae* (Rauzer-Chernousova), *E*. aff. *decurta* (Rauzer-Chernousova), *E.* cf. *cooperi* (D. Zeller), "*Millerella" tortula* D. Zeller, *Eostaffella* ex gr. *postmosquensis* Kireeva.

Sample 42 (3). Bryozoan wackestones, dolomitized, with *Eostaffella prisca* Rauzer-Chernousova, *E.* cf. *pseudoovoidea* Reitlinger.

Sample 43 (1). Crinoid-bryozoan wackestones strongly dolomitized.

Sample 44 (5). Bryozoan-crinoidal wackestones strongly dolomitized (fine-crystalline) in some thin sections. Wackestones includes endothyroid biofacies of foraminifers: *Endothyra* sp., *Planoendothyra* sp., *Semiendothyra tantala* (D. Zeller), *Neoarchaediscus* sp.

Sample 45 (1). Spicule-bryozoan wackestone-packstone with ostracodes, clean bioclastic medium-sized grains of bryozoans and pelmatozoans, micrite heterogeneous with microbioclastics. Foraminifers: *Endothyra* sp., *Paraarchaediscus* sp., *Betpakodiscus* sp.

Flatwoods-Kerley Cemetery railroad cut: Menard Limestone (Brenckle et al., 2005, fig. 36, Stop 16).

Samples 47 and 48 were taken from the lower 4 m of the outcrop.

Sample 47 (10). Wackestone-packstone with clean bioclastic grains, heterogeneous micrite cement with microbioclastics. Foraminifers: *Ammovertella* sp., *Pseudoglomospira* sp., *Pseudoammodiscus* sp. *Endothyra pseudobradyi* Brazhnikova, *Endothyra* ex gr. *bowmani* Phillips, *Globoendothyra* sp., *Endothyranopsis plana* Brazhnikova, *Endostaffella parva* (Möller), *Planoendothyra* sp., *Globivalvulina eogranulosa* Reitlinger, *Asteroarchaediscs baschkiricus* (Krestovnikov and Theodorovich), *Betpakodiscus* sp., *Brenckleina rugosa* (Brazhnikova).

Sample 48 (6). Foraminifer-bioclstic wackestone-packstone with bryozoans, pelmatozoans, brachiopods. Algae: *Stacheoides*, dasycladaceans. Foraminifers: *Ammovertella* sp., *Pseudoammodiscus* sp., *Earlandia* sp., *Endothyra phrissa* (D. Zeller), *E.* ex gr. *excellens* (D. Zeller), *Rectoendothyra* cf. *latiformis* (Brazhnikova), *Eosigmoilina* sp., *Eolasiodiscus* sp., *Asteroarchaediscus baschkiricus*, *Paraarchaediscus* sp.

Southern Illinois Stone Company quarry: Kinkaid Limestone, Goreville Member (Brenckle et al., 2005, fig. 38, Stop 17).

Sample 49 (10). Bioclastic-foraminiferal wackestones-packstone, micrite homogenous, sometimes recrystallized, includes ostracodes, pelmatozoans, bryozoans, and rare brachiopods.

Foraminifers: *Pseudoglomospira* sp, *Endothyra phrissa*, *Janischewskina* sp.(juvenile), *Loeblichia minima* Brazhnikova, *Eostaffellina* aff. *paraprotvae* (Rauzer-Chernousova), *Eostaffella pseudostruvei* (Rauzer-Chernousova and Belyaev), *E.* aff. *acuta* (Grozdilova and Lebedeva), *E. postmosquensis* Kireeva,

E. parastruvei (Rauzer-Chernousova), *E. cooperi* (D. Zeller), *Plectostaffella* ex gr. *varvariensis* (Brazhnikova and Potievskaya), *Eosigmoilina explicata* Ganelina, *Brenckleina rugosa*, *Asteroarchaediscus baschkiricus*, *Neoarchaediscus postrugosus*, *Palaeotextularia* spp., *Climacammina* sp., *Consobrinella consobrina* (Lipina).

Correlation and Discussion

The most abundant foraminifers were found in the Beech Creek Limestone, Vienna Limestone, Menard Limestone, and Kinkaid Limestone. Foraminifers were for the first time studied from the Beech Creek Limestone of the Modoc South section, Glen Dean Limestone of the Coles Mill section, and Vienna Limestone of the Grantsburg Northeast railroad cut section. Based on the foraminifer-based correlation, it may be suggested that the Beech Creek Limestone of Illinois corresponds to the base of the Serpukhovian, whereas the Kinkaid Limestone corresponds to the uppermost Serpukhovian.

The foraminiferal assemblage of the Beech Creek Limestone is very interesting and peculiar. *Zellerinella discoidea* are abundant in sample 25 and archaediscids are predominant in sample 26. The presence of "*Millerella"* sp., "*Millerella" tortula, Neoarchaediscus postrugosus,* and *N.* ex gr. *probatus* enables correlation with the lower Serpukhovian *Neoarchaediscus postrugosus* beds of Zaborie quarry (Gibshman, 2001, 2003), the *Eolasiodiscus donbassicus* Zone (east-Uralian zone) of the Verkhnyaya Kardailovka section, southern Urals (Nikolaeva et al., 2005), and the *N. postrugosus* Zone of the General Carboniferous Scale of Russia (Kagarmanov and Kossovaya, 2003). Earlier, Gibshman (2001, 2003) suggested that the basal Serpukhovian in the type Zaborie section correlated with the Glen Dean Limestone in Kentucky based on the appearance of "*Millerella" tortula* as reported by Zeller (1953). In the Zaborie section, "*Millerella*" *tortula* in association with *N. postrugosus* is found near the level of *L. ziegleri* (Nikolaeva et al., 2002). The same two species were found in the Beech Creek Limestone at the Modoc South locality beneath the Glen Dean Limestone.

The Verkhnyaya Kardailovka section, which is composed of relatively deep-water, open-shelf carbonates, contains relatively impoverished foraminiferal assemblages in the Viséan-Serpukhovian interval, similar to the biofacies of the Beech Creek. The base of the Serpukhovian at Verkhnyaya Kardailovka is defined by the evolutionary appearance of the conodont *Lochriea ziegleri*, near the base of the beds containing the ammonoid *Dombarites paratectus* (Nikolaeva et al., 2005). The Upper Viséan foraminiferal assemblage includes *Planoendothyra* sp., *Omphalotis* sp., *Mediocris breviscula*, *Endostaffella delicata, E. asymmetrica, Endothyra* sp., single *Pseudoammodiscus* sp., *Paraarchaediscus koktjubensis, Archaediscus* ex gr. *timanicus, Asteroarchaediscus rugosus,* and *A. parvus*. This assemblage continues into the overlying Serpukhovian *Eolasiodiscus donbassicus* Zone, showing the first appearance of *Eolasiodiscus muradymicus* Kulagina, *Monotaxinoides* (?) sp., *Planospirodiscus* sp., and very small *Neoarchaediscus* sp., followed slightly above by *N. postrugosus*.

Foraminiferal assemblages of the Haney and Glen Dean Limestones are very impoverished and are different from the Glen Dean assemblage in Kentucky (Zeller, 1953), but the presence of *Neoarchaediscus* cf. *probatus* and *N.* cf. *postrugosus* suggests a Serpukhovian age.

The Vienna Limestone contains endothyrids with a three-layered wall (two thin dark tectoria separated by a light granular layer) characteristic of the genus *Semiendothyra*. Similar taxa were described by D. Zeller (1953) from the Paint Creek of the type Chesterian of late Viséan age. From the Vienna Limestone, *Eostaffella* ex gr. *cooperi*, small *Eostaffellina* aff. *decurta,* and *E.* ex gr. *paraprotvae* were also identified. The Vienna Limestone is likely to correlate with the middle part of the Serpukhovian, possibly, the *Eostaffellina decurta* Zone in Zaborie and the lower part of the *E. paraprotvae* Zone of the Urals. The lower part of the *E. paraprotvae* Zone correlates with the upper part of the *Uralopronorites – Cravenoceras* Genozone and probably with the *Tumulites varians* Zone in America (Nikolaeva et al., 2005).

The foraminiferal assemblages from the Menard and Kinkaid Limestones are close to those described in Brenckle et al. (2005, p.43-44). The assemblage of the Menard Limestone contains species characteristic of the upper Serpukhovian (Zapaltyubinian) of the Donetz Basin (Aizenverg et al., 1983), such as *Rectoendothyra* cf. *latiformis, Endothyranopsis plana, Brenckleina rugosa,* and *Globivalvulina eogranulosa.*

The foraminiferal assemblage of the Kinkaid Limestone is close to that from the uppermost Serpukhovian of the Donets Basin (D_5^7 Limestone), but differs in the higher diversity of Eostaffellidae. The presence of eostaffellids, such as *Eostaffella pseudostruvei, E. acuta, E. postmosquensis,* and *Plectostaffella,* is characteristic of the *Plectostaffella varvariensis* Zone (equivalent to the lower part of the *Pl. bogdanovkensis* Zone of the General Carboniferous Scale of Russia) of the Syuranian Substage of the Bashkirian Stage of the Urals. The co-occurrence of numerous upper Serpukhovian eosigmoilinids with numerous lower Bashkirian Eostaffellidae is particularly interesting and is not observed in the South Urals.

Acknowledgements

William Zempolich of Mobil Oil provided financial support for Gibshman and Kulagina to attend the type Mississippian field trip in 2001. Paul Brenckle helped locate the stratigraphic positions of samples collected during that trip. The authors are grateful to Paul Brenckle and Philip Heckel for many helpful suggestions and for critically reviewing the manuscript.

References

Aisenverg, D. E., T. V. Astakhova, N. E. Berchenko, N. E. Brazhnikova, M. V. Vdovenko, N. N. Dunaeva, N. V. Zernetzkaja, V. J. Poletaev, and M. T. Sergeeva. 1983. Upper Serpukhovian Substage in the Donets Basin (paleontological characteristics). Naukova Dumka (Kiev), 164 p. (in Russian).

Brenckle, P. L., H. R. Lane, P. H. Heckel, and E. C. Rankey. 2005. Stop descriptions, p. 1-54. *In* P. H. Heckel (ed.), Stratigraphy and Biostratigraphy of the Mississippian Subsystem (Carboniferous System) in its Type Region, the Mississippi River Valley of Illinois, Missouri, and Iowa. I.U.G.S. Subcommission on Carboniferous Stratigraphy Guidebook for Field Conference, 8-13 September 2001, St. Louis. Illinois State Geological

Survey Guidebook, 34.
Gibshman, N. B. 2001. Foraminiferal biostratigraphy of the Serpukhovian Stage stratotype (Zaborie quarry, Moscow Basin). Newsletter on Carboniferous Stratigraphy, 19:31-34.
Gibshman, N. B. 2003. Foraminifera characteristics of the Serpukhovian stratotype in Zaborie quarry (Moscow Basin, Russian Platform). Stratigraphy and Geology Correlation, 11(1):39-63. (In Russian and English)
Heckel, P. H. (ed.). 2001. Stratigraphy and biostratigraphy of the Mississippian Subsystem (Carboniferous System) in its type region, the Mississippi River Valley of Illinois, Missouri, and Iowa: International Union of Geological Sciences, Subcommission on Carboniferous Stratigraphy Guidebook for Field Conference, 8-13 September 2001, 108 p. (Reprinted in 2005 as Illinois State Geological Survey Guidebook 34, 105 p.)
Kagarmanov, A. Kh., and O. L. Kossovaya. 2003. Carboniferous Scale of Russia. Postanovleniaya Mezhvedomstvennogo stratigraphicheskogo komiteta i ego postoyannukh komissii, S-Peterburg, 39 p. (In Russian)
Kulagina, E. I., N. B. Gibshman, and V. N. Pazukhin. 2003. Foraminiferal zonal standard for Lower Carboniferous of Russia and its correlation with conodont zonation. Rivista Italiana di Paleontologia e Stratigrafia, 109(2):173-185.
Nikolaeva, S. V., N. B. Gibshman, E. I. Kulagina, I. S. Barskov, and V. N. Pazukhin. 2002. Correlation of the Viséan-Namurian boundary in its type region (Moscow Basin) and the South Urals and a proposal of boundary markers (ammonoids, foraminifers, and conodonts). Newsletter on Carboniferous Stratigraphy, 20:16-21.
Nikolaeva, S.V., E. I. Kulagina, V. N. Pazukhin, and N. N. Kochetova. 2001. Integrated Serpukhovian biostratigraphy in the South Urals. Newsletter on Carboniferous Stratigraphy, 19:38-42.
Nikolaeva, S. V., E. I. Kulagina, V. N. Pazukhin,, T. I. Kucheva, T. I. Stepanova, N. N. Kochetova, N. B. Gibshman, E. O. Amon, V. A. Konovalova, and G. F. Zainakaeva. 2005. Advances in understanding of the Viséan-Serpukhovian boundary in the South Urals and its correlation. Newsletter on Carboniferous Stratigraphy, 23:27-30.
Zeller, D. E. N. 1953. Endothyroid foraminifers and ancestral fusulinids from the type Chesterian (Upper Mississippian). Journal of Paleontology, 27(2):183-199.

Bimodal pattern of the Late Paleozoic Ice Age

Carlos R. González and Pamela Díaz Saravia

CONICET, Fundación M. Lillo, Miguel Lillo 251, 4000 Tucumán, Argentina.

Evidence of the Late Paleozoic glaciations is widespread throughout Gondwana. By contrast, in the Northern Hemisphere mainly indirect evidence may be evaluated, but these show significant coincidence with the succession of events that occurred in the South American Gondwana area.

Faunal and sedimentation patterns in the Carboniferous to Early Permian deposits of Argentina allow a reliable reconstruction of the climatic fluctuations that occurred during this period. They indicate that major climatic changes occurred at the beginning and end of the Ice Age, and that other less severe but also important changes in temperature occurred at the beginning and again at the end of the Late Pennsylvanian. These evidences reveal that glaciations should not be considered as a single continuous low temperature event, but that they occurred within two discrete episodes of cold maxima: the "mid-Carboniferous" and the Early Permian glacial periods that were interrupted by a period of climatic amelioration during the Upper Pennsylvanian.

A model for development of the "mid-Carboniferous" glaciations is the San Eduardo Formation in western Argentina (González, 1990), with complementary evidence furnished by the Pampa de Tepuel Formation in central Patagonia (Suero, 1948). This glacial period is associated with the "Barrealense" fauna (González, 1993) which is assigned to the Serpukhovian-Bashkirian.

The Early Permian glaciations in Gondwana are mostly Asselian to Early Sakmarian (Tastubian) in age (Dickins, 1985). Later findings in deposits of western Argentina and central Patagonia show that diamictites, mixtites, and dropstone mudstones occur within the lower part of the "Uspallatense" faunal stage of Asselian age (González, 2003). These sediments were probably deposited during the oldest Early Permian glacial phases. On the other side, in the Sauce Grande Basin of eastern Argentina a nearly 1000-m thick basal unit consisting of glacial deposits occurs below beds bearing the "Bonetense" (*Eurydesma*) fauna and the *Glossopteris* flora of Sakmarian age. These glacial deposits represent the younger Early Permian glacial phases.

In the central-western Andes of Argentina, a nearly 3000-m thick sequence of non-glacial sediments is interposed between the "mid-Carboniferous" and the Early Permian glacial deposits. These sediments bear the Upper Pennsylvanian faunas here reunited in the Aguanegran faunal stage and the *Nothorhacopteris* (NBG) flora, which indicate humidity and "warm" climate, revealing the existence of a long-lasting interglacial during this epoch. As previously stated (González, 2003, 2006; González and Díaz Saravia, 2007), these evidences are in discrepancy with two widely accepted ideas: 1) the theory of migration of glacial centers that was differently depicted by authors (DuToit, 1927; King, 1958; Frakes et al., 1971; Caputo and Crowell, 1985) but essentially the same, and 2) the existence of a continuous glaciation stretching from the "mid-Carboniferous" to the Early Permian, alleged by Veevers and Powell (1987) and followers.

The northern polar region was totally oceanic during this time, but we can assume from the estimated magnitude of the Gondwana glaciations (González and Díaz Saravia, 2007) that this region was probably also covered with ice, as happened during the Cenozoic Ice Age. In the Northern Hemisphere, paleoclimatic trends recognized in the mid- and high latitudes show an outstanding coincidence with the paleoclimatic development in the southwestern margin of Gondwana.

The bimodal pattern of the Upper Paleozoic glaciations exposed in sequences, faunas, and floras of western Argentina and

central Patagonia, is reflected in changes of floral assemblages in the paleotropical forests of the Northern Hemisphere. The Ostrogsky cooling episode (Durante, 2000), the greatest event in the Angara floral history, was accompanied by endemic "cold" faunas in surrounding marine basins, as noted by Ganelin and Durante (2002). This cooling episode occurred during the mid-Carboniferous glacial period of Gondwana. Furthermore, the Late Pennsylvanian climatic warming exposed in deposits of western Argentina and the Early Permian glacial period of Gondwana, are correlated with the Alykaevo climatic optimum and the Early Permian global cooling respectively recorded in the Angara province, as shown by Cleal and Thomas (2005). These coincidences are not fortuitous; the bipolarity of this Ice Age may be same as during the Cenozoic glaciations, and these paleoclimatic episodes can be regarded as global events, as indicated by Ganelin and Durante (2002).

With some limitations due to evidences based on matching up different biologic events (flora and fauna), these coincidences provide a new basis for correlation between the Northern and Southern Hemispheres during the time elapsed from the late Viséan to the early Sakmarian.

References

Caputo, M. V., and J. C. Crowell. 1985. Migration of glacial centers across Gondwana during the Paleozoic Era. Bulletin of the Geological Society of America, 96:1020-1036.

Cleal, C .J., and B. A. Thomas. 2005. Palaeozoic tropical rainforests and their effect on global climates: is the past the key to the present? Geobiology, 3:13-31.

Dickins, J. M. 1985. Late Paleozoic glaciation. BMR Journal of Australian Geology and Geophysics, 9:163-169.

Durante, M.. 2000. Global cooling in the middle Carboniferous. Newsletter on Carboniferous Stratigraphy, 18:31-32.

Du Toit, A. L. 1927. A geological comparison of South America with South Africa; with a paleontological contribution by F.R. Cowper Reed. Carnegie Institute Publication, 381, 158 p.

Frakes, L. A., J. L. Matthews, and J. C. Crowell. 1971. Late Paleozoic glaciation, Part III: Antarctica. Bulletin of the Geological Society of America, 82:1581-1604.

Ganelin, V. G., and M. V. Durante. 2002. Biostratigraphy of the Carboniferous of Angaraland. Newsletter on Carboniferous Stratigraphy, 20:23-26.

González, C. R. 1990. Development of the Late Paleozoic glaciations of the South American Gondwana in western Argentina. Palaeogeography, Palaeoclimatology, Palaeoecology, 79:275-287.

González, C. R. 1993. Late Paleozoic faunal succession in Argentina. XII International Congress on the Carboniferous and

<table>
<tr><th>Age (º)</th><th>Southwestern Gondwana (*)</th><th>Angara (+)</th><th>Faunal Stages</th></tr>
<tr><td>Sakmarian</td><td></td><td></td><td rowspan="2">Bonetian</td></tr>
<tr><td>Asselian</td><td rowspan="2">Early Permian glacial period</td><td rowspan="2">Early Permian Global cooling</td></tr>
<tr><td>Gzhelian</td><td rowspan="3">Interglacial period</td><td rowspan="3">Alykaevo climatic optimum</td><td rowspan="3">Aguanegran</td></tr>
<tr><td>Kasimovian</td></tr>
<tr><td>Moscovian</td></tr>
<tr><td>Bashkirian</td><td rowspan="3">Mid-Carboniferous glacial period</td><td rowspan="3">Ostrogsky cooling episode</td><td rowspan="3">Barrealian</td></tr>
<tr><td>Serpukhovian</td></tr>
<tr><td rowspan="2">Viséan</td></tr>
<tr><td>Tournaisian</td><td></td><td></td><td>Malimanian</td></tr>
</table>

(º) Not to scale. (*) González, 1990, 2001, 2003. (+) Cleal and Thomas, 2005). Modified from González and Díaz Saravia, 2007.

Permian, Buenos Aires, Comptes Rendus, 1: 537-550.
González, C. R. 2001. New data on the Late Palaeozoic glaciations in Argentina. Newsletter on Carboniferous Stratigraphy, 19:44-45.
González, C. R. 2003. Additional comments on the Upper Paleozoic glaciations in Argentina. Newsletter on Carboniferous Stratigraphy, 21:25-26.
González, C. R. 2006. Lower Permian bivalves from central Patagonia, Argentina. Paläontologische Zeitchrift, 80 (2):130-155.
González, C. R., and P. Díaz Saravia. 2007. Faunas y Paleoclimatología del Paleozoico Superior de Argentina: revisión crítica. Acta Geológica Lilloana, 20 (1):41-72.
King, L. C. 1958. Basic palaeogeography of Gondwanaland during the Late Palaeozoic and Mesozoic Eras. Quarterly Journal of the Geological Society of London, 114:47-77.
Suero, T. 1948. Descubrimiento del Paleozoico superior en la zona extraandina de Chubut. Boletín de Informaciones Petroleras, 287:31-48.
Veevers, J. J., and C. M. Powell. 1987. Late Paleozoic glacial episodes in Gondwanaland reflected in transgressive-regressive depositional sequences in Euramerica. Bulletin of the Geological Society of America, 98:475-487.

Centenary celebrations for three famous Ukrainian geologists

Tamara I. Nemyrovska[1], Victor Ogar[2], Vladislav I. Poletaev[1], and Maya V. Vdovenko[1]

[1]Institute of Geological Sciences, Ukrainian Academy of Sciences, Kiev, Ukraine.

[2]Kiev National University, Kiev, Ukraine.

The Geological Society of Ukraine held two meetings this year to celebrate the centenaries of three of their famous geologists, paleontologists, and Carboniferous stratigraphers, who were all born in 1908: Prof. Dr. Olgerd L. Einor, Prof. Dr. David E. Aisenverg, and Dr. Nina E. Brazhnikova. Geologists from Russia, Moldova, and Byelorussia also took part in these meetings.

The first meeting was devoted to Prof. Dr. O. L. Einor. It took place on April 16-17, 2008, in Kiev, and was organized by Kiev National University, Institute of Geological Sciences of the National Academy of Sciences of Ukraine, and Geological Society of Ukraine. The biography of O. L. Einor was published before this meeting. After memorials by colleagues and students honoring Prof. Einor, lectures on Carboniferous biostratigraphy, paleontology, petroleum resources, and subdivisions of the Carboniferous System were presented. The materials of the conference were published as: Problemy Stratigrafii Kamyanovugil'noi Systemy (Problems of Carboniferous Stratigraphy), edited by P.F.Gozhik and S.A.Vyzhva, in Sbirnyk Naukovykh Prats (Proceedings of Scientific Works): Kyiv, 2008, 160 p. (in Russian, Ukrainian, and English).

Olgerd L. Einor was born on May 26, 1908 in the town of Poltava, central Ukraine, in a family of physicians.

Prof. Dr. Olgerd L. Einor

After graduation from gymnasium in Poltava, he entered Leningrad University in spite of difficulties for young people from "bourgeois" families after the October Revolution. He graduated from the university in 1930, and started work at the Coal Institute in Leningrad, and later at the Uralian Geological Survey in Sverdlovsk. In this position, he discovered one of the famous coal fields and was awarded the PhD degree. Before the Second World War, he worked in the Arctic Institute of the Main Administration of the Northern Sea Route. During the war, he, like many other geologists, was working in northern Russia where he discovered a series of coal fields in the Vorkuta area. In 1946, he completed his habilitation on the coal region of northern Russia. In 1949, he worked in Alma-Ata (Kazakhstan) as Chief of the Paleontological Department. In 1950, he was invited to Kiev State University, where he worked as a professor until his death. He organized geological field work in the Urals, Kazakhstan, Donbas, Caucasus, Central Asia, Azov, and Dniester areas. His main interest was the Carboniferous System. As a paleontologist he studied Carboniferous and Permian brachiopods. A considerable part of his work was devoted to tectonics and regional and historical geology. He was the initiator of the compilation of the Atlas of Paleogeographical Maps of the USSR for the Carboniferous, published in 1965. He also wrote papers on the life and activities of famous Russian geologists, such as Chernyshev, Kryshtofovich, Likharev, Rozov, Rotay, Voinovky-Kriger, Nalivkin, and Andrusov.

His legacy is more than 200 publications, among them 17 monographs and atlases. He was an author and compiler of more than 20 sheets of geological maps of Ukraine, Urals, Kazakhstan and Siberian Platform. The capstone of this work was the editorship of the Soviet Union part of The Carboniferous of the World, Volume III, published in Madrid in 1996.

O. L. Einor was a very good teacher, and he educated many students who are working now as famous specialists in different parts of the former Soviet Union and abroad. He was a highly educated person, as he loved music, art, literature and theater. He was a very good sportsman in chess and tennis. He died on December 9, 1991 and was buried in Kiev.

The second meeting was devoted to Prof. Dr. David E. Aisenverg, Prof. Dr. Olgerd L. Einor, and Dr. Nina E. Brazhnikova. It was organized by the Institute of Geological Sciences of the National Academy of Sciences of Ukraine, Symferopol University (Crimea), and the Ukrainian Paleontological Society, and took place in Symferopol on May 20-23. There were several sections: Paleozoic, Mesozoic, and Cenozoic, in which a number of talks on paleontology and biostratigraphy were presented by Ukrainian, Russian, Byelorussian, and Moldovan workers. A one-day excursion visited the spectacular Jurassic and lowermost Cretaceous rocks of Crimea. All the talks were published in a thick volume Biostratygrafichni osnovy pobudovy stratygrafichnykh skhem fanerozoyu Ukrainy (Biostratigraphic fundamentals of creating the stratigraphic schemes of the Phanerozoic of Ukraine), edited by P. F. Gozhik in Sbirnyk Naukovykh Prats Instituta Geologichnykh Nauk Ukrainy (Proceeding of the Institute of Geological Sciences of the National Academy of Sciences of Ukraine), Kyiv, 2008, 560 p. (in Russian and Ukrainian).

David E. Aisenverg was born on October 12, 1908 in the town of Nikolaev, southern Ukraine in the family of a ship insurance agent of the Russian Transport and Insurance Society. In 1923 his family moved to Kiev, where he continued his education in school and later professional school, after which he became a technician-topographer. He worked in Byelorussia and Russia as a hydrotechnician. In 1933, after 6 years of field work, he entered the Kiev Mining Institute, then the Geographical-Geological Department of Kiev State University. He graduated in 1938 and became a postgraduate student in the Institute of Geological Sciences of the Academy of Sciences of Ukraine. During the Second World War, he was in the southern Urals in Ufa along with other workers of the Institute of Geological Sciences. In the Urals he was chief of prospecting for new manganese deposits, which was necessary for manufacturing tanks for the war effort. After the war, he wrote a dissertation on the results of his work in the Urals and received his PhD in 1945. All his work after the war was devoted to Carboniferous stratigraphy and paleontology, primarily of the Donets Basin. He took part in creating a detailed stratigraphical section and legends to the maps of the lower Carboniferous in Donbas. He discovered three sedimentary assemblages (now regional stages) in the lower Carboniferous of Donbas and took part in the organization of the All-Soviet Union Meeting on the content of the Namurian Stage and in the preparation of the Carboniferous paleogeographical maps of Ukraine and Moldova. Together with his co-authors he provided the paleontological characteristics of two mid-Carboniferous horizons (Zapaltyubinsky and Voznesensky) with stratotypes in the Donets Basin. He took an active part in the construction of the Carboniferous sub-regional stratigraphic scheme for the Don-Dnieper Depression, which formed the basis for the modern Carboniferous Stratigraphical Scheme of Ukraine. As a paleontologist he studied Carboniferous brachiopods.

Prof. Dr. David E. Aisenverg

He published more than 120 papers and educated a number of paleontologists and stratigraphers. He was a highly educated person. He liked poetry and music, and had a very good library and extensive classical and folk music record collection. His sense of humor and wide erudition, in combination with a democratic mentality, his honesty and principles, made him a very well-liked person by his colleagues and students. He passed away in 1994 and was buried in Kiev.

The famous Carboniferous foraminiferal worker **Nina I. Brazhnikova** was born on May 8, 1908 in the town of Zhitomyr (west of Kiev) in a family of teachers. After she graduated from Zhitomyr Institute of Folk Education, she became a postgraduate student in the Institute of Geological Sciences of the Academy of Sciences of Ukraine in 1932. From 1934 on, she was a scientific worker at this institute. For more than 40 years she studied Carboniferous foraminifers and Carboniferous stratigraphy at the institute during a time of extensive search for mineral resources in Carboniferous rocks. All this time she worked on detailed subdivision of the Carboniferous and on construction of detailed stratigraphic sections for the areas where the Carboniferous is only in the subsurface. She studied hundreds of boreholes in the Lvov-Volhyn area, Dnieper-Donets Depression, Donbas, and the basin on the south slope of the Voronezh Anteclise. She was a real workoholic, as her working day lasted 14-15 hours. She was the author of the first detailed Carboniferous Stratigraphic Scheme of the Dnieper-Donets Depression.

Dr. Nina I. Brazhnikova

Together with Prof. Dr. Aisenverg, she established the late Visean age for coals in a new industrial area in the Western Donbas, and provided a basis for the first detailed scheme of the Carboniferous of the Lvov-Volhyn Coal Basin. She contributed much to the problem of the Namurian Stage, the establishment of new horizons within the Serpukhovian Stage, and the mid-Carboniferous boundary problem in Ukraine. She published more than 50 papers, and she educated a number of workers in micropaleontology, who are now working in scientific and industrial geological organizations in Ukraine.

She devoted her whole life to science. She was an educated, intelligent, modest, kind and principled scientist, and her opinion was always valued by her colleagues. Nina E. Brazhnikova died on February 7, 1992 and was buried in Kiev.

ANNOUNCEMENTS

INTERNATIONAL FIELD MEETING OF THE I.U.G.S. SUBCOMMISSION ON CARBONIFEROUS STRATIGRAPHY

[Provisionally August 2009, exact dates to be specified later]

ORGANIZERS

Paleontological Institute, Russian Academy of Sciences
Profsoyuznaya 123,117997 Moscow, Russia
Tel: ++7(495)3391044 Fax: ++7(495)3391266

Prof. Aleksandr Alekseev - aaleks@geol.msu.ru
Dr. Natalia Goreva - goreva@ginras.ru
Dr.Olga Kossovaya - koss@mail.wplus.ru
Dr. Svetlana Nikolaeva - 44svnikol@mtu-net.ru
Dr. Vera Konovalova - konovalovavera@mail.ru

Institute of Geology Ufa Research Center Russian Academy of Sciences
(Ufa City)
K. Marx Street. 16/2
Tel.: (347)2228256, Fax: (347) 2230368

Prof. Victor N. Puchkov - puchkov@anrb.ru
Dr. Elena I. Kulagina - kulagina@anrb.ru
Dr. Nataliya Kochetova - ig@anrb.ru

OVERVIEW

The principal objectives of the excursion are to examine the key Carboniferous sections in the Moscow Basin and southern Urals (Fig. 1). The subjects to be addressed include: 1) lithology and biostratigraphy of the key Carboniferous sections and intra- to interbasinal correlations; 2) shallow and deep-water carbonates; 3) paleosols, bioherms, and cephalopod-rich facies; 4) overview of the Carboniferous fossil record in Russia including discussion of major zonal schemes and their correlation; and 5) examination of Carboniferous GSSP candidate sections.

CONFERENCE REGISTRATION AND FIRST CIRCULAR

For detailed up-to-date information about the SCCS Field Conference, please see the first circular, which will be placed on the internet at http://www. paleo.ru during the summer or fall of 2008.

If you are interested in attending the SCCS field conference, please either obtain a registration form from the organizers or download one from the website.

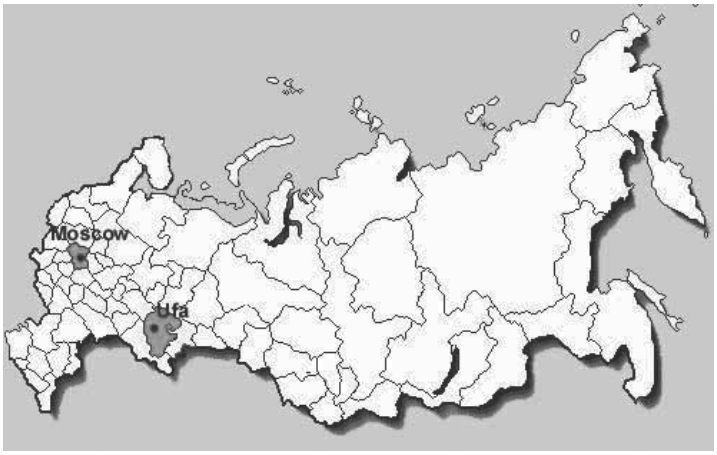


Fig. 1. Map of Russia showing Moscow and Ufa. The distance from Moscow to Ufa is 1,318 km.

VISA TO ENTER RUSSIAN FEDERATION

Please check with the Russian consulate in your country to see if you need a visa to enter the Russian Federation. If you require a visa, please inform the organizers konovalovavera@mail.ru and kulagina@anrb. The organizers will send foreign participants a conference registration form that must be filled in and returned to the organizers. Foreign participants requiring a visa also need to send a scanned copy of the photograph page of their passports to the organizers as an e-mail attachment. Organizers will use the conference registration form and scanned passport to obtain a letter of invitation for visiting scientists from the Ministry of Foreign Affairs. Use the letter of invitation to apply for your visa from the Russian consulate in your country.

PROVISIONAL PROGRAM FOR EXCURSION

August --- Arrive in Moscow and spend night in Academy of Science Hotel (cost €70-80 per night); dinner in hotel. Organizers will meet participants at the airport and transport them to their hotel.

Part 1 - Carboniferous Succession of the Moscow Basin

Day 1. August --- Trip to the Novogurovsky quarry and possibly the Zaborie quarry (Fig. 2) or Dashkovka section. At these localities, we will examine the Viséan - Serpukhovian Stages (Tulian, Aleksinian, Mikhailovian, Venevian, Tarusian, Steshevian, and Protvian Regional Substages). Accommodation will be at the Academy of Science Hotel

in Moscow (cost €70-80 per night); breakfast and dinner in the hotel restaurant; lunch in field.

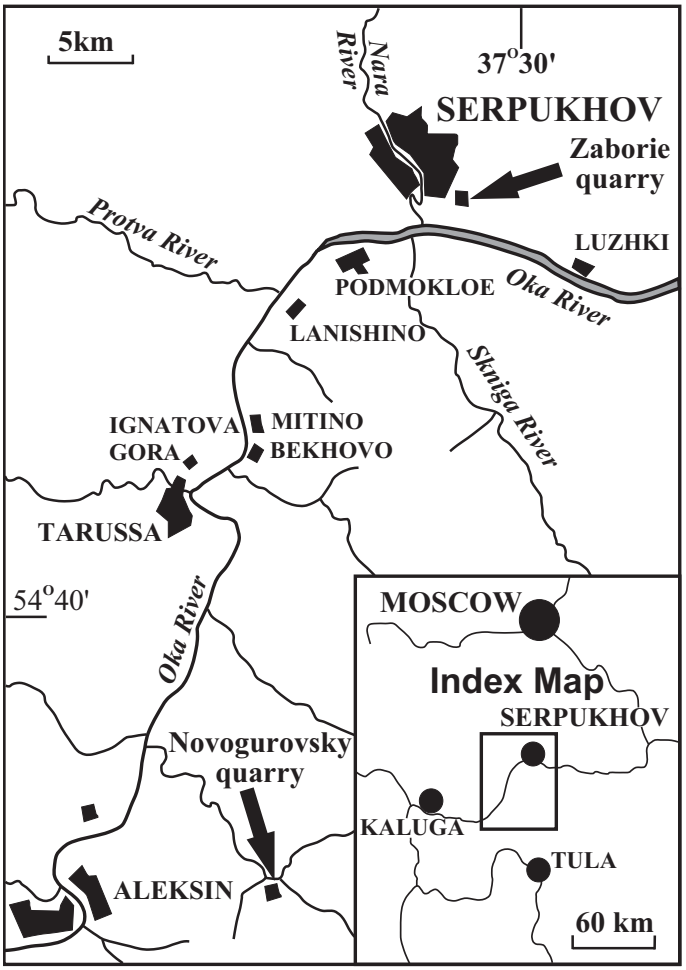


Fig. 2. Map of Moscow Basin region showing locations of the Zaborie and Novogurovsky quarries for day 1.

Day 2. August --- Trip to the Domodedovo quarry (Fig. 3), where we will examine the Moscovian Stage (Podolskian and Myachkovian Regional Substages). At the Afanasievo quarry (Fig. 4), we will see the Kasimovian Stage (Krevyakinian and Khamovnikian Regional Substages) and at the Gzhel quarry (Fig. 5) participants will examine the Gzhelian succession (Rusavkino Formation). Accommodation will be at the Academy of Science Hotel in Moscow (cost €70-80 per night); breakfast and dinner in the hotel restaurant; lunch in field.

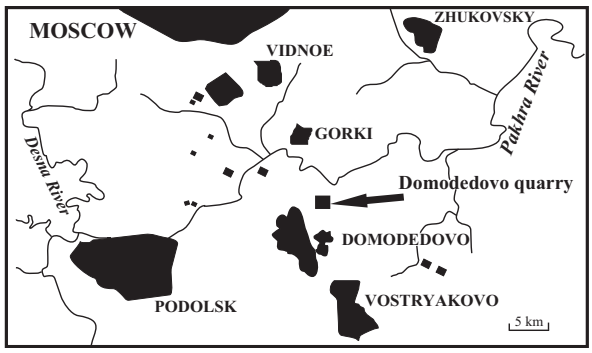


Fig. 3. Map of the Moscow Basin region showing location of Domodedovo quarry for day 2.

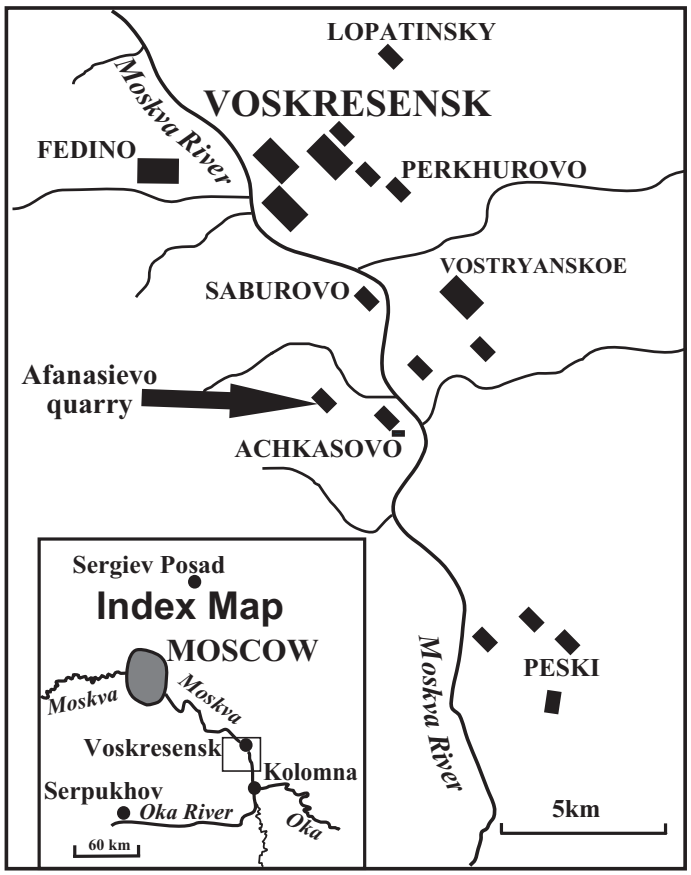


Fig. 4. Map of the Moscow Basin region showing location of Afanasievo quarry for day 2.

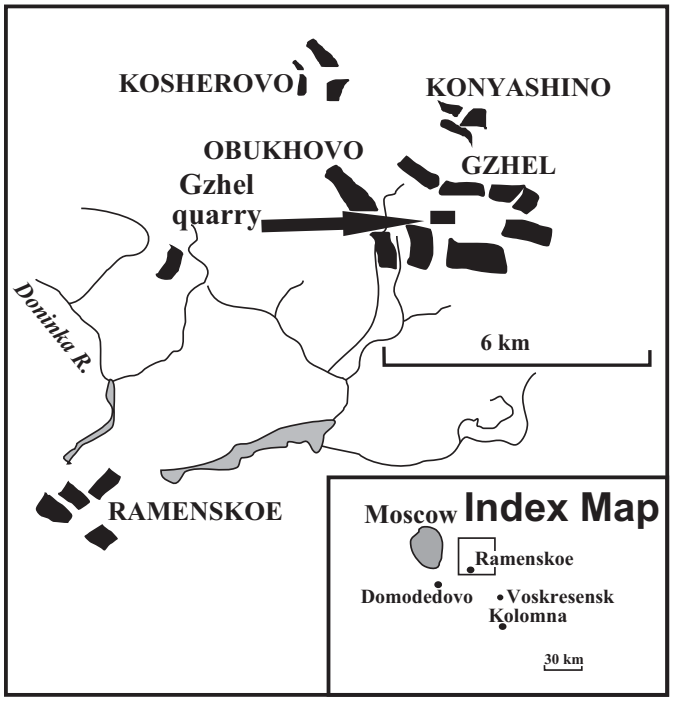


Fig. 5. Map of the Moscow Basin region showing location of the Gzhel quarry for day 2.

Day 3. August --- After breakfast in Academy of Science Hotel in Moscow, we will take a morning flight to Ufa (Fig. 1) on a local airline - cost about €190. From Ufa, drive 100 km to the town of Sterlitamak for night in a hotel (European standard accommodation at €50-60 per night) and dinner in a local restaurant.

Part 2 - Carboniferous Succession of the Southern Urals

Day 4. August --- After breakfast in a local restaurant, drive 1 hour from city of Sterlitamak to the Sikaza River (Fig. 6) and examine sections spanning the Devonian-Carboniferous boundary near Sikaza and Zigan. After lunch in the field, we will drive 70 km to the town of Krasnousolsk to examine the Usolka section and a potential GSSP for the Kasimovian-Gzhelian boundary. Drive back to Sterlitamak to spend night in a hotel (cost €50-60 per night); dinner in a local restaurant.

Fig. 6. Map of southern Urals showing localities (triangles) that will be visited on days 4 to 9. Arrows indicate direction of travel.

Day 5. August --- After breakfast in a local restaurant, drive from Sterlitamak to the city of Sibai. Examine Serpukhovian flysch in the Kugarchi section (along the highway near of village of Kugarchi, Fig. 6); take lunch in the field. Spend night in the Sibai Hotel (cost €30-40 per night) and dinner in a local restaurant.

Day 6. August --- After breakfast in the Sibai Hotel, we will drive about 120 km from Sibai to a section by the village of Verkhnyaya Kardailovka (Fig. 6). This section is a candidate for the Viséan-Serpukhovian boundary GSSP and includes deep-water carbonates containing abundant ammonoids; lunch in the field. Return to Sibai for night at the Sibai Hotel (cost €30-40 per night) and dinner in a local restaurant.

Day 7. August --- Breakfast in the Sibai Hotel.

Technical Session in the Sibai Hotel

The technical sessions will be held in the conference hall of the Sibai Hotel.

Oral presentations are scheduled for 20 minutes (including question period). The conference room will be equipped with a computer and projector for Microsoft PowerPoint presentations. Poster presentations are welcome. Languages - official languages of the conference are English and Russian. Lunch will be in the Sibai Hotel.

Evening program: After dinner in a local restaurant, there will be an excursion to Talkas Lake or/and the Gadelshino Waterfall in the Irendyk Mountain Range, about a 30 minute drive from Sibai. Return to Sibai for night at the Sibai Hotel (cost €30-40 per night).

Abstracts

Short communications or expanded abstracts should be submitted before 15 April 2009 in English or Russian. They should not exceed four single-spaced A4 pages, including line drawing illustrations and references. Submissions should be sent by e-mail to Elena I. Kulagina, kulagina@anrb.ru as attachments. Send text as Microsoft Word documents in RTF format; send illustrations as TIFF, JPG or CDR (Corel Draw) files. A volume containing the abstracts will be available at the meeting.

Day 8. August --- After breakfast in the Sibai Hotel, drive 30 km from Sibai to sections along the Bolshoi Kizil River (tributary of the Ural River) (Fig. 6) to examine Viséan shallow-water carbonates, Serpukhovian algal and coral bioherms and Bashkirian bioherms. We will have a field lunch then drive 30 minutes to the nearby Khudolaz River and examine Viséan, Serpukhovian, and Bashkirian shallow-water carbonates with corals and brachiopods. Return to Sibai for night in the Sibai Hotel (cost €30-40 per night) and dinner in a local restaurant.

Day 9. August --- After breakfast in the Sibai Hotel, drive from Sibai to Ufa (about 11-12 hours) via the Basu section, where we will examine Moscovian carbonates. We will have a field lunch. In the afternoon, participants will have dinner in the field then fly from Ufa to Moscow on a local airline and spend the night in the Academy of Science Hotel (€70-80 per night).

August --- Participants can fly back to their country of origin from Moscow. Organizers will arrange transport to the airport.

APPROXIMATE COST OF FIELD MEETING

The cost of the field meeting will be about €270 for the Moscow Basin component of the trip. The Uralian component of the trip will include about €230-280 for hotels and a €200 fee to cover conference registration, ground transportation, breakfasts and lunches. The hotel in Moscow will cost about €70-80 per night and the hotel in Ufa and Sibai about €40-70 per night. The evening dinners are not included in the cost estimates. The cost of the flight from Moscow to Ufa is approximately €190. The organizers will make the reservations for the flight.

SCCS VOTING & CORRESPONDING MEMBERSHIP 2008

Please check your entry and report any changes to the Secretary

ALGERIA

Mrs Fatma Abdesselam-Rouighi
Centre de Recherche et Developpement
Ave du 1er Novembre
35000 Bounerdes
ALGERIA

A. Sebbar
Universite de Boumerdes
Faculte des Hydrocarbures et de la Chimie
Dept. Gisements Miniers et Petroliers.
Ave du l' Independance
35000 Boumerdes
ALGERIA
Fax: (213) 24 81 91 72
Email: sebbar_2001@yahoo.fr

ARGENTINA

Dr S. Archangelsky
URQUIZA 1132
Vicente Lopez
1638 Buenos Aires
Rep. ARGENTINA
Fax: 54-1-982-4494
Email: sarcang@overnet.com.ar

Dr Carlos Azcuy
Depto. de Ciencias Geológicas
Pabellón 2, Ciudad Universitaria
1428 Núñez, Buenos Aires
Rep. ARGENTINA
Fax: 54-1-638-1822
Email: azcuy@aspapa.org.ar

Dr Silvia Césari
Div. Paleobotanica
Museo de Cs. Naturales 'B.Rivadavia'
Av. A. Gallardo 470
1405 Buenos Aires
Rep. ARGENTINA

Dr N. Rubén Cuneo
Palaeontological Museum 'E. Feruglio'
Av. 9 de Julio 655
9100 Trelew, Chubut
Rep. ARGENTINA

Dr Carlos R. González
Dirección de Geología
Fundación Miguel Lillo
Miguel Lillo 251
4000 Tucumán
Rep. ARGENTINA
Fax: 081-330868
Email: crgonzalez@csnat.unt.edu.ar

Mercedes di Pasquo
Facultad de Ciencias Exactas y Naturales.
Depto. Geologia. Ciudad Universitaria. Pabellon II. Nuñez.
Capital Federal. C.P. 1428.
Rep. ARGENTINA
Email: medipa@aspapa.org.ar
medipa@tango.gl.fcen.uba.ar

Dr Arturo C. Taboada
Instituto de Paleontologia
Fundación Miguel Lillo
Miguel Lillo 251
4000 S.M. deTucumán
Rep. ARGENTINA

Dr M.S. Japas
Depto. de Ciencias Geológicas
Pabellón 2, Ciudad Universitaria
1428 Núñez, Buenos Aires
Rep. ARGENTINA

Dr Nora Sabattini
Universidad Nacional de la Plata
Facultad de Ciencias Naturales Y Museo
Paseo del Bosque
1900, La Plata
Rep. ARGENTINA

AUSTRALIA

Dr J.C. Claoué-Long
Aust. Geol. Survey Organisation
P.O. Box 378
Canberra City, A.C.T. 2601
AUSTRALIA
Fax: 06-249-9983
Email: jclong@agso.gov.au

Dr B.A. Engel
10 Fay Avenue
New Lambton, NSW 2305
AUSTRALIA
Email: bengel@kooee.com.au

Dr P.J. Jones
Department of Earth and Marine Sciences
The Australian National University
Canberra ACT 0200
AUSTRALIA
Fax: 61-2-62495544
Email: peter.jones@ems.anu.edu.au

Dr L. Masini
Department of Zoology
La Trobe University
Melbourne, VIC 3086
AUSTRALIA
Fax: 61-3-94791551
Email: lisa@zoo.latrobe.edu.au

Dr I. Metcalfe
Asia Centre
University of New England
Armidale, NSW 2351
AUSTRALIA
Fax: 02-67733596
Email: imetcal2@une.edu.au

Prof. G. Playford
Earth Sciences/
School of Physical Sciences
The University of Queensland
Brisbane,
AUSTRALIA 4072
Fax: 07-3365-1277
Email: geoff@earth.uq.edu.au

Prof. J. Roberts
School of Applied Geology
The University of New South Wales
Sydney, NSW 2052
AUSTRALIA
Fax: 61-2-9385-5935
Email: J.Roberts@unsw.edu.au

Dr Guang R. Shi
School of Ecology and Environment
Deakin University
Melbourne Campus
221 Burwood Highway
Burwood, VIC 3125
AUSTRALIA
Email: grshi@deakin.edu.au

S. Stojanovic-Kuzenko
71 Barracks Road
Hope Valley
Adelaide, SA 5090
AUSTRALIA
Fax: 373-4098

Dr S. Turner
Queensland Museum
122 Gerler Road
Hendra, QLD 4011
AUSTRALIA
Fax: 61-7-3406-8355
Email: sue.turner@qm.qld.gov.au
s.turner@uq.edu.au

AUSTRIA

Dr F. Ebner
Institut für Geowissenschaften
Montanuniversität Leoben
A-8700 Leoben
AUSTRIA

Dr K. Krainer
Inst. für Geol. und Paläontologie
Universität Innsbruck
Innrain 52
A-6020 Innsbruck
AUSTRIA
Fax: 0043-512-507-5585
Email: Karl.Krainer@uibk.qc.at

Prof. Dr H.P. Schönlaub
Geol. Bundesanstalt Wien
Postfach 127
Rasumofskygasse 23
A-1031 Wien
AUSTRIA
Fax: +431-712-5674-56
Email: hpschoenlaub@cc.geolba.ac.at

BELGIUM

Dr F.-X. Devuyst
Unité de Géologie
Université Catholique de Louvain
3 place Louis Pasteur
1348, Louvain-la-Neuve
BELGIUM
Email: devuyst@hotmail.com

Dr Michiel Dusar
Geological Survey of Belgium
Jenner str. 13
B-1000 Brussels
BELGIUM
Email: michiel.dusar@naturalsciences.be

Dr E. Groessens
Service Géologique de Belgique
13, rue Jenner 1000
Bruxelles
BELGIUM
FAX: 02/6477359
Email: eric.groessens@sciencesnaturelles.be

Dr Luc Hance
Unité de Géologie
Université Catholique de Louvain
3 place Louis Pasteur
1348, Louvain-la-Neuve
BELGIUM
FAX: 322-647-7359
Email: hance@geol.ucl.ac.be

Prof. Bernard L. Mamet
Laboratoire de Geologie
Universite de Bruxelles
50 avenue F.D. Roosevelt
Bruxelles B1050
BELGIUM

Prof. E. Poty
Service de Paléontologie animale
Universitè de Liège
Bât. B18, Sart Tilman
B-4000 Liège
BELGIUM
Fax: 32-43-665338

Hon. Prof. Maurice Streel
University of Liège
Paleontology,
Sart Tilman Bat. B18
B-4000 LIEGE 1
BELGIUM
Fax: 32-4-366 5338
Email: Maurice.Streel@ulg.ac.be

Dr Rudy Swennen
Fysico-chemische geologie
Katholieke Universiteit Leuven
Celestijnenlaan 200C
B-3001 Heverlee
BELGIUM

BRAZIL

Mr L.E. Anelli
Instituto de Geosciências
Universidade de São Paulo
CP 11348 CEP 05422-970
São Paulo
BRAZIL
Fax: 55-011-818-4129
Email: anelli@usp.br

Dr U.G. Cordani
Instituto de Geosciências
Universidade de São Paulo
CP 11348 CEP 05422-970
São Paulo
BRAZIL

Dr Jose Henrique G. Melo
Petrobras/Cenpes/PDEXP/BPA
1112 Cicade Universitaria
Quadra 7, Ilha do Fundao
21941-598 Rio de Janeiro
BRAZIL
Fax: 55-21-2590-1291
Email: jhmelo@petrobras.com.br

Dr A.C. Rocha-Campos
Instituto de Geosciências
Universidade de São Paulo
CP 11348 CEP 05422-970
São Paulo
BRAZIL
Fax: 11-818-4129
Email: acrcampo@usp.br

Dr Paulo Alves de Souza
Departamento de Paleontologia e Estratigrafia
Instituto de Geosciências
Universidade Federal do Rio Grande do Sul
Av. Bento Gonçalves, 9500
91.540-000 - Porto Alegre - RS
BRAZIL

Email: 1363669@vortex.ufrgs.br

BULGARIA

Dr Y.G. Tenchov
Geol.Inst. ul. Acad.
Bonchev bloc. 24
Sofia 1113
BULGARIA
Email: geoins@bgearn.acad.bg

CANADA

Dr Wayne Bamber
Geol.Surv.Canada, Calgary
3303-33rd St. N.W.
Calgary AB, T2L 2A7
CANADA
Fax: 403-292-6014
Email:bamber@gsc.nrcan.gc.ca

Dr B. Beauchamp
Geol.Surv.Canada, Calgary
3303-33rd St. N.W.
Calgary AB, T2L 2A7
CANADA

Dr A.R. Berger
Geological Survey of Canada
Room 177, 601 Booth Street
Ottawa ON, K1A 0E8
CANADA

Dr P.H. von Bitter
Royal Ontario Museum
100 Queen Park
Toronto ON, M5S 2C6
CANADA

Fannie Couzaris
Redpath Museum
McGill University
859 Sherbrooke West
Montreal, PQ, H3A 2K6
CANADA
Email:
fanniecouzaris@yahoo.ca

Dr W.R. Danner
University of British Columbia
Dept Earth & Ocean.Sciences
6339 Stores Rd.
Vancouver B.C., V6T 1Z4
CANADA

Dr Martin Gibling
Department of Geology
Dalhousie University
Halifax N.S., B3H 3J5
CANADA

Prof. Charles Henderson
Department of Geology
& Geophysics
The University of Calgary
2500 University Drive, N.W.
Calgary AB, T2N 1N4
CANADA
Fax: 1 403 284 0074
Email:
henderson@geo.ucalgary.ca

Dr W. Nassichuk
Geological Survey of Canada
3303-33rd St. N.W.
Calgary AB, T2L 2A7
CANADA

Dr M.J. Orchard
Geological Survey of Canada
101-605 Robson Street,
Vancouver, B.C., V6B 5J3
CANADA
Fax: 604-666-1124
Email:
morchard@gsc.nrcan.gc.ca

Dr Sylvie Pinard
2209 Vimy Way S.W.
Calgary, AB T2T 6H7
CANADA
Email: s.pinard@shaw.ca

Dr Catherine Reid
Dept. of Geological Sciences and Geo. Eng.
Miller Hall
Queen's University
Kingston ON, K7L 3N6
CANADA
Email: reid@geol.queensu.ca

Dr B.C. Richards
Geological Survey of Canada
3303-33rd St. N.W.
Calgary AB, T2L 2A7
CANADA
Fax: 403-292-5377
Email: brichards@gsc.emr.ca

Dr Michael Rygel
Department of Earth Sciences
Dalhousie University
Halifax,
Nova Scotia B3H 4J1
CANADA
Fax: 902-494-6889
Email: mike rygel@hotmail.com

Dr J. Utting
Geol.Surv.Canada, Calgary
3303-33rd St. N.W.
Calgary AB, T2L 2A7
CANADA
Fax: 403-292-6014
Email: JUtting@NRCan.gc.ca

Dr Erwin L. Zodrow
Univ. College of Cape Breton
Dept Geology, Glace Bay H'way
Sydney N.S., B1P 6L2
CANADA
Fax: 902-562-0119
Email:
ezodrow@sparc.uccb.ns.ca

CZECH REPUBLIC

Dr Jirí Kalvoda
Dept. Geol. Paleont.
Masaryk University
Kotlárská 2
61137 Brno
CZECH REPUBLIC
Email:
dino@sci.muni.cz

Dr Jirí Král
Dept Genetics & Microbiology
Fac. Science, Charles University
Vinicná 5
128 44 Praha 2
CZECH REPUBLIC

RNDr Stanislav Oplustil
Charles University
Institute of Geology & Palaeontology
Albertov 6
CZ-128 43 Prague
CZECH REPUBLIC
Email:
oplustil@prfdec.natur.cuni.cz

Dr Jirí Pesek
Dept. Geol. Paleontol., Fac. Science
Charles University
128 43 Praha 2, Albertov 6
CZECH REPUBLIC
Fax: +02-296-084

RNDr Zbynek Simunek
Czech Geological Survey
Klárov 3/131
CZ-118 21 Prague
CZECH REPUBLIC

Email: simunek@cgu.cz

EGYPT

Dr Mahmoud M. Kholief
Egyptian Petroleum Research Inst
Nasr City, 7th Region
Cairo
EGYPT
Fax: 202-284-9997

FRANCE

Dr J-F. Becq-Giraudon
1 rue de Villiers
79500 - Melle
FRANCE
Email:
jfbecqgiraudon@wanadoo.fr

Dr Alain Blieck
Université de Lille 1:
Sciences de la Terre
Laboratoire de Paléontologie et Paléogéographie du Paléozoïque (LP3)
UMR 8014 du CNRS
F-59655 Villeneuve d'Ascq cedex
FRANCE
Fax: 00 333 20 43 6900
Email:
Alain.Blieck@univ-lille1.fr

Dr O. Bruguier
ISTEEM,
Université de Montpellier II,
34 095 Montpellier, Cedex 5
FRANCE
Email:
Olivier.Bruguier@dstu.univ-montp2.fr

Henri Fontaine
8 Allee de la Chapelle
92140 Clamart
FRANCE
Fax: 33-1-40940892

Dr Alain Izart
Université de Nancy I
Département des Sciences de la Terre
BP 239, 54506 Vandoeuvre les Nancy
FRANCE
Fax: (33) 83 91 25 89
Email:
Alain.Izart@g2r.u-nancy.fr

Dr J.P. Laveine
Musée d'Histoire Naturelle de Lille
19 rue de Bruxelles
F-59000 Lille
FRANCE
Fax: +33 320 861482
Email:
jplaveine@mairie-lille.fr

Dr Marie Legrand-Blain
Institut de Géodynamique
Université de Bordeaux 3
1 Allee F. Daguin
33607 Pessac
FRANCE
Fax: 56-848-073

Home: "Tauzia"
33170 Gradignan
FRANCE
Fax: (0)5-56-89-33-24
Email: egrandblain@wanadoo.fr

Dr D. Mercier
Ecole des Mines de Paris
35, Rue Saint-Honoré
F-77305 Fontainebleau
FRANCE

Dr G.S. Odin
Lab.Géochron.et Sédim.Océanique
Univ. P.&M.Curie, 4 Place Jussieu
case 119
F-75252 Paris Cédex 05
FRANCE
Fax: 33-1-4427-4965
Email: gilodin@ccr.jussieu.fr

Dr M.F. Perret
Université Paul-Sabatier
Lab.Géol.Structurale
38 rue des 36 Ponts
F-31400 Toulouse
FRANCE
Fax: 61-55-82-50
Email: perret@cict.fr

Dr Carine Randon
Université Pierre et Marie Curie - Paris 6
Dépt. Géologie sédimentaire
Labo. Micropaléontologie
Case 104
4 Place Jussieu
F-75252 Paris cedex 05
FRANCE
Email:

Dr Daniel Vachard
Université de Lille 1:
Sciences de la Terre
Laboratoire de Paléontologie et Paléogéographie du Paléozoïque (LP3)
UMR 8014 du CNRS
F-59655 Villeneuve d'Ascq cedex
FRANCE
Fax: +33 320 436900
Email:
Daniel.Vachard@univ-lille1.fr

GERMANY

Dr H.W.J. van Amerom
Geol.Landesamt Nordrh.-Westfalen
De Greiff Str.195
D-47803 Krefeld
GERMANY
Fax: 2151-897-505

Prof. Dr Michael R. W. Amler
Institut für Geologie und Palaeontologie
der Philipps-Universitaet Marburg
Hans-Meerwein-Strasse
D-35032 Marburg
GERMANY
Fax: +49 (0)6421 282-8919
Email:
amler@mailer.uni-marburg.de

Dr Markus Aretz
Universität zu Köln
Institut für Geologie und Mineralogie
Zülpicher Str. 49a
D-50674 Köln
GERMANY
Fax: +49 221 470 5080
Email:
markus.aretz@uni-koeln.de

Prof. Dr. R. Thomas Becker
Westfälische Wilhelms-Universität
Geologisch-Paläontologisches Institut u. Museum
Corrensstrasse 24
D-48149 Münster
GERMANY
Email: rbecker@uni-muenster.de

Dr Z. Belka
Inst.und Mus.für Geol.und Paläont.
Universität Tübingen
Sigwartstr. 10
D-72076 Tübingen
GERMANY
Email:
belka@ub.uni-tuebingen.de

Prof. Dr. Carsten Brauckmann
Technische Universität Clausthal
Institut für Geologie und Paläontologie
Leibnizstrasse 10
D-38678 Clausthal-Zellerfeld
GERMANY
Fax: 05323-722903
Email:
Carsten.Brauckmann@tu-clausthal.de

Dr Peter Bruckschen
Ruhr-Universität Bochum
Geologisches Institut
Universitätsstr. 150
D-44801 Bochum
GERMANY

Dr Günter Drozdzewski
Geologisches Landesamt Nordrhein-Westfalen
De-Greiff-Str. 195
D-47803 Krefeld
GERMANY
Fax ++49-2151-89 75 05
Email: drozdzewski@gla.nrw.de

Dr Holger Forke
Institut für Paläontologie
Loewenichstr. 28
D-91054 Erlangen
GERMANY
Email:
forke@pal.pal.uni-erlangen.de

Christoph Hartkopf-Fröder
Geologischer Dienst NRW
De-Greiff-Str. 195
D-47803 Krefeld
GERMANY
Fax: +49(0)-2151-897505
Email:
hartkopf-froeder@gd.nrw.de

Prof. Dr Hans-Georg Herbig
Universität zu Köln,
Geologisches Institut
Zülpicher Str. 49a
D-50674 Köln
GERMANY
Fax: +49-221-470-5080
Email:
herbig.paleont@uni-koeln.de

Dr Peer Hoth
Bundesanstalt für Geowissenschaften und Rohstoffe
AS Berlin
Wilhelmstr. 25-30
D-13539 Berlin
GERMANY
Fax ++49-30-36 99 31 00
Email: peer.hoth@bgr.de

Prof. Dr Hans Kerp
Westfälische Wilhelms-Universität
Abt.Paläobot.am Geol-Pal.Inst. u Mus.
Hindenburgplatz 57-59
D-48143 Münster
GERMANY
Fax: 49-251-834-831
Email: Kerp@uni-muenster.de

Dr Dieter Korn
Naturhistorisches Forschungsinstitut
Museum für Naturkunde
Humboldt-Universität zu Berlin
Institut für Paläontolgie
Invalidenstrasse 43
D-10115 Berlin
GERMANY
Fax ++49-(0) 30 2093 8568
Email:
dieter.korn@museum.hu-berlin.de

Prof. Dr. J. Kullmann
Inst.und Mus.für Geol.und Paläont.
Universität Tübingen
Sigwartstr. 10
D-72076 Tübingen
GERMANY
Fax: +49-7473-26768
Email:
Juergen.Kullman@uni-tuebingen.de

Dr Manfred Menning
GeoForschungs Zentrum Potsdam
Telegrafenberg, Haus C128
D-14473 Potsdam
GERMANY
Fax: +49-331-288-1302
Email: menne@gfz-potsdam.de

Dr Klaus-Jürgen Müller
Institut für Paläontologie
Nussallee 8,
D-53115 Bonn
GERMANY

Dr E. Paproth
Schwanenburgstr. 14
D-47804 Krefeld
GERMANY
Fax: +49-2151-710774

Dr Elias Samankassou
Institute of Paleontology
University of Erlangen-Nuernberg
Loewenichstrasse 28
D-91054 Erlangen
GERMANY
Fax: +49-9131-85 22690
Email:
samelias@pal.uni-erlangen.de

Prof. Dr. Jörg Schneider
TU Bergakademie Freiberg
Institut für Geologie
Bernhard-von-Cotta-Str. 2
D-09596 Freiberg
GERMANY
Fax ++49-3731-39 35 99
Email:
schneidj@geo.tu-freiberg.de

Dr D. Stoppel
Bundesanst.für Geowissen. u. Rohstoffe
Postfach 51 0153
D-30631 Hannover
GERMANY
Fax: 511-643-2304

Dr E. Thomas
Rhsbergstr. 22
D-58456 Witten-Herbede
GERMANY

Dr Dieter Weyer
Löwestr. 15
D-10249 Berlin
GERMANY
Email:
dieter.weyer@t-online.de

Dr Volker Wrede
Geologisches Landesamt Nordrhein-Westfalen
de-Greiff-Str. 195
D-47803 Krefeld
GERMANY
Fax ++49-2151-89 75 42
Email:
volker.wrede@gd.nrw.de

HUNGARY

Dr Sc. Heinz Kozur
Rézsü u. 83
H-1029 Budapest
HUNGARY
Fax: +36-1-204-4167
Email: h12547koz@ella.hu

IRELAND

Dr Geoff Clayton
Department of Geology
Trinity College
Dublin 2
IRELAND
Fax: 3531-6711199
Email: gclayton@tcd.ie

Dr Ken Higgins
Department of Geology
University College
Cork
IRELAND

Dr G.D. Sevastopulo
Department of Geology
Trinity College
Dublin 2
IRELAND
Email: gsvstpul@tcd.ie

ISRAEL

Dr Olga Orlov-Labkovsky
Department of Zoology
Tel-Aviv University
Tel-Aviv 69978
ISRAEL
Email: olgaorl@post.tau.ac.il

ITALY

Prof. Mario Pasini
Universitarà delle Studi di Siena
Dipartimento di Sienza della terra
I-53100 Siena
ITALY

JAPAN

Dr Shuko Adachi
Akoya-chou 1-12-6
Yamagata
Yamagata, 990-0025
JAPAN

Dr Masayuki Ehiro
Tohoku Univ. Museum
Aoba, Aramaki
Aoba-ku
Sendai, 980-8578
JAPAN
Fax: +81-22-795-7759
Email:
ehiro@mail.tains.tohoku.ac.jp

Dr Yoichi Ezaki
Dept. Geosciences
Fac. Science
Osaka City Univ.
Sumiyoshi-ku
Osaka, 558-8585
JAPAN

Dr Masayuki Fujikawa
Akiyoshi-dai Muse.
Natural History
Mine-gun
Yamaguchi, 754-0511
JAPAN
Fax: +81-837-62-0324
Email: mafujikw@ymg.urban.ne.jp

Mr Takehiko Haikawa
Akiyoshi-dai Sci. Muse.
Nat. Hist.
Shuhou-chou, Mine-gun
Yamaguchi, 754-0511
JAPAN

Mr Masahiro Ichida
Kyoto Univ. Museum
Kyoto Univ.
Yoshida Honmachi, Sakyo-ku
Kyoto, 606-8501
JAPAN

Dr Hisaharu Igo
Jindaiji-kitamachi 4-16-5
Chofu
Tokyo, 182-0011
JAPAN

Dr Hisayoshi Igo
Sakae-chou 1-31-7
Tachikawa
Tokyo, 190-0003
JAPAN
Email: igohisa@mac.com
igohisay@beige.plala.or.jp

Mr Atsushi Kaneko
Fukae-honchou 1-15-7
Higashi-nada-ku
Kobe, 658-0021
JAPAN

Dr Makoto Kato
Hokkaido Univ. Museum
Kita 10-jou, Nisi 8-choume
Kita-ku
Sapporo, 060-0810
JAPAN
Fax: +81-11-706-2724

Dr Toshio Kawamura
Dept. Earth Sci., Fac. Education
Miyagi Univ. Education
Aoba-ku
Sendai, 980-0845
JAPAN
Email:
t-kawa@staff.miyakyo-u.ac.jp

Dr Toshio Koike
Tokiwadai 36-6-606
Hodogaya-ku
Yokohama, 240-0067
JAPAN
Email: koikebaltan@yahoo.co.jp

Dr Koichi Nagai
Dept. Physics & Earth Sciences
Fac. Sciences
Univ. the Ryukyus
Nishihara
Okinawa, 903-0213
JAPAN
Email: k-nagai@sci.u-ryukyu.ac.jp

Dr Tsutomu Nakazawa
Geological Survey of Japan
AIST
Tsukuba, 305-8567
JAPAN
Fax: +81-29-861-3591
Email: t-nakazawa@aist.go.jp

Ma Yohoko Okumura
Kuzuu Fossil Museum
Kuzuuhigashi 1-11-15
Sano
Tochigi, 327-0501
JAPAN

Dr Masamichi Ota
c/o Kitakyushu Museum
Natural History & Human History
Higashida 2-4-1
Yahatahigashi-ku
Kitakyushu, 805-0071
JAPAN
Fax: +81-93-661-7503

Dr Yasuhiro Ota
Kitakyushu Museum
Natural History & Human History
Higashida 2-4-1
Yahatahigashi-ku
Kitakyushu, 805-0071
JAPAN
Fax: +81-93-661-7503

Dr Hiroyoshi Sano
Dept. Earth & Planetary Sci.
Faculty of Sciences
Kyushu Univ.
Fukuoka, 812-8581
JAPAN
Fax: +81-92-642-2686
Email: sano@geo.kyushu-u.ac.jp

Dr Tetsuo Sugiyama
Dept. Earth System Sci.
Fac. Science
Fukuoka Univ.
Jonan-ku
Fukuoka, 814-0180
JAPAN
Fax: +81-92-865-6030
Email: sugiyama@fukuoka-u.ac.jp

Dr Jun-ichi Tazawa
Dept. Geology
Fac. Science
Niigata Univ.
Niigata, 950-2181
JAPAN
Fax: +81-25-262-6194
Email:
tazawa@geo.sc.niigata-u.ac.jp

Dr Katsumi Ueno
Dept. Earth System Sci.
Fac. Science
Fukuoka Univ.
Johnan-ku
Fukuoka, 814-0180
JAPAN
Email: katsumi@fukuoka-u.ac.jp

KAZAKHSTAN

Dr V. Koshkin
KazIMS
ul. K. Marx, 105
480100 Almaty
REP. KAZAKHSTAN

Dr Alexei Pronin
3, Dossorskaya Str.
Atyrau, 465002
REP. KAZAKHSTAN

Dr M.I. Radchenko
ul. Shagabutdinova 80 kv. 39
480059 Alma-Ata
REP. KAZAKHSTAN

KYRGYZSTAN

Dr Alexandra V. Djenchuraeva
Agency on Geology and Mineral Resources of Kyrgyz Republic
prospekt Ekindik 2
720300 Bishkek
KYRGYZSTAN
Email:
mail@geoagency.bishkek.gov.kg

Alexandr V. Neyevin
Agency on Geology and Mineral Resources of Kyrgyz Republic
prospekt Ekindik 2
720300 Bishkek
KYRGYZSTAN
Email:
mail@geoagency.bishkek.gov.kg

Timur Yu. Vorobyov
Agency on Geology and Mineral Resources of Kyrgyz Republic
prospekt Ekindik 2
720300 Bishkek
KYRGYZSTAN
Email:
mail@geoagency.bishkek.gov.kg

Olga Getman
Agency on Geology and Mineral Resources of Kyrgyz Republic
prospekt Ekindik 2
720300 Bishkek
KYRGYZSTAN
Email:
mail@geoagency.bishkek.gov.kg

MALAYSIA

Ibrahim bin Amnan
Technical Services Division
Minerals and Geoscience Department Malaysia
Jalan Sultan Azlan Shah
31400 Ipoh
Perak,
MALAYSIA
Email:
ibrahim@jmg.gov.my

Dr Masatoshi Sone
Institute for Environment and Development (LESTARI)
Universiti Kebangsaan Malaysia
43600 Bangi, Selangor
MALAYSIA
Email:
masatoshi.sone@gmail.com

NEW ZEALAND

Dr J.B. Waterhouse
25 Avon St.
Oamaru
NEW ZEALAND

PEOPLES REP. CHINA

Prof. Hou Hongfei
Episodes
P.O. Box 823
26 Baiwanzhuang Road
Beijing 100037
PEOPLES REPUBLIC OF CHINA

Dr Gao Lianda
Inst. Geol., Chinese Acad.Geol. Sciences
Baiwanzhuang Road
Beijing
PEOPLES REPUBLIC OF CHINA

Dr Guo Hongjun
Changchun College of Geology
6 Ximinzhu Street
Changchun, Jilin
PEOPLES REPUBLIC OF CHINA

Dr Jin Xiao-chi
Institute of Geology
Chinese Academy of Geological Sciences
26 Baiwanzhuang Road
Beijing 100037
PEOPLES REPUBLIC OF CHINA
Email: jinxchi@cags.net.cn

Dr Li Xingxue
Nanjing Inst. Geol. Paleont.
Academia Sinica, Chi-Ming-Ssu
Nanjing 210008
PEOPLES REPUBLIC OF CHINA
Fax: 86-25-3357026
Email: lixx@njnet.ihep.ac.cn

Dr Ouyang Shu
Nanjing Inst. of Geol. & Palaeont.
Academia Sinica, Chi-Ming-Ssu
Nanjing 210008
PEOPLES REPUBLIC OF CHINA
Fax: 86-25-335-7026
Email: lixx@njnet.nj.ac.cn

Dr Yang Shipu
China University of Geosciences
Chengfu Lu
Beijing 100083
PEOPLES REPUBLIC OF CHINA

Prof. Wang Xiang-dong
Nanjing Institute of Geology and Palaeontology
Chinese Academy of Sciences
39 East Beijing Road
Nanjing 210008
PEOPLES REPUBLIC OF CHINA
Email: xdwang@nigpas.ac.cn

Prof. Wang Zhi-hao
Nanjing Institute of Geology and Palaeontology
Academia Sinica
Nanjing 210008
PEOPLES REPUBLIC OF CHINA
Email: fmxu@nigpas.ac.cn

POLAND

Prof. Jerzy Fedorowski
Institute of Geology
Adam Mickiewicz University
Maków Polnych 16
PL-61601 Poznan
POLAND
Fax: 48-61-536-536
Email: jerzy@vm.amu.edu.pl

Dr Tadeusz Peryt
Dept of Chemical Resources
Panstwowy Instytut Geologiczny
Rakowiecka 4
PL-00975 Warszawa
POLAND

Dr S. Skompski
Institute of Geology, Warsaw Univ.
Al Zwirki i Wigury 93
PL-02089 Warszawa
POLAND
Fax: 0-048-22-220-248
Email:
skompski@sungeo.biogeo.uw.edu.pl

Dr Elzbieta Turnau
Institute of Geological Sciences PAS
Senacka 1
PL-31002 Krakow
POLAND
Email: ndturnau@cyf-kr.edu.pl

PORTUGAL

Prof. M.J.Lemos de Sousa
Dept. de Geologia, Fac.Ciências
Universidade do Porto
Praça de Gomes Teixeira
4099-002 Porto
PORTUGAL
Fax: (+ 351) 22 3325937
Email: mlsousa@fc.up.pt

Prof. J.T. Oliveira
Instituto Geológico e Mineiro
Estrada da Portela, Bairro Zambujal
Apartado 7586
2720 Alfragide
PORTUGAL

RUSSIA

Dr Alexander S. Alekseev
Dept of Palaeont., Geol. Faculty
Moscow State University
119991 Moscow GSP-1
RUSSIA
Fax: 70953391266
Email: aaleks@geol.msu.ru

Dr I.S. Barskov
Dept. of Paleontology, Geology Faculty
Moscow State University
119991 Moscow GSP-1
RUSSIA
Fax: 7095-9392190

Dr I.V. Budnikov
Siberian Inst. Geol., Geophys.& Min. Res.
Siberian Geological Survey
Krasny prospekt 67
630104 Novosibirsk
RUSSIA
Fax: 383-2-20-35-17, 22-57-40

Dr T.V. Byvsheva
ul. Bolshaia Academycheskaja
77 kor.1 kv. 154
125183 Moscow
RUSSIA

Dr Boris Chuvashov
Inst. Geology/Geochemistry
Russian Academy of Sciences
Pochtoryi per. 7
620151 Ekaterinburg
RUSSIA
Email: chuvasov@igg.uran.ru

Dr Marina V. Durante
Geological Institute
Russian Academy of Sciences
Pyzhevsky per. 7
109017 Moscow
RUSSIA
Fax: +7-95-231-0443
Email: durante@ginran.msk.su

Dr A.V. Durkina
Timan-Pechora Research Center
ul. Pushkina 2
169400 Ukhta
Komi Republic
RUSSIA
Fax: 6-13-04

Dr V.G. Ganelin
Geological Institute
Russian Academy of Sciences
Pyzhevsky per. 7
109017 Moscow
RUSSIA

Dr Nilyufer B. Gibshman
Moscow Oil and Gas Academy
Leninsky Prospect 65
117917 Moscow GSP-1
RUSSIA
Email:
nilyufer@mtu-net.ru

Dr N. Goreva
Geological Institute
Russian Academy of Sciences
Pyzhevsky per. 7
109017 Moscow
RUSSIA
Fax: +7-095-231-04-43
Email:
goreva@ginras.ru

Dr Igor A. Ignatiev
Geological Institute
Russian Academy of Sciences
7 Pyzhevsky per.
119017 Moscow
RUSSIA

Dr T.N. Isakova
Geological Institute
Russian Academy of Sciences
Pyzhevsky per. 7
109017 Moscow
RUSSIA
Fax: +7-095-231-04-43
Email:
isakova@ginras.ru

Dr R.M. Ivanova
Instit. of Geology & Geochemistry
Uralian Branch, Russian Academy of Sciences
Pochtovyi per. 7
620151 Ekaterinburg
RUSSIA
Email: root@igg.e-burg.su

Dr Pavel B. Kabanov
Paleontological Institute
Russian Academy of Sciences
Profsoyuznaya 123
117868 Moscow GSP
RUSSIA
Email: kabanov@paleo.ru

Dr Alexander G. Klets
Institute of Geology and Mineralogy of RAS
Koptyug 3
630090 Novosibirsk
RUSSIA
Email: KletzAG@uiggm.nsc.ru

Dr L.I. Kononova
Dept. of Paleontology,
Geology Faculty
Moscow State University
119991 Moscow GSP-1
RUSSIA

Dr M.V. Konovalova
Timan-Pechora Research Center
ul. Pushkina 2
169400 Ukhta
Komi Republic
RUSSIA
Fax: 6-13-04

Dr Olga L. Kossovaya
V.S.E.G.E.I.
Sredni pr. 74
199106 St Petersburg
RUSSIA
Email: koss@mail.wplus.net

Dr Elena I. Kulagina
Inst. Geology
Uralian Res. Center
Russian Academy of Sciences
Ufa RUSSIA
Email: kulagina@anrb.ru

Dr S.S. Lazarev
Paleontological Institute
Russian Academy of Sciences
Profsoyuznaya 123
117868 Moscow GSP
RUSSIA

Dr M.M. Marfenkova
ul. Bolshaya Akademicheskaya 77
Korpus 1, Kr. 338
125183 Moscow
RUSSIA

Dr Yulia V. Mosseichik
Geological Institute
Russian Academy of Sciences
7 Pyzhevsky per.
119017 Moscow
RUSSIA
Email: mosseichik@ginras.ru

Dr E. V. Movshovich
P.O. Box 1204
344091 Rostov-na-Donu-91
RUSSIA

Dr Svetlana Nikolaeva
Paleontological Institute
Russian Academy of Sciences
Profsoyuznaya 123
117868 Moscow GSP
RUSSIA
Email: 44svnikol@mtu-net.ru

Dr Olga A. Orlova
Department of Paleontology
Geology Faculty
Moscow State University
119991 Moscow GSP-1
RUSSIA
Email: oorlova@geol.msu.ru

Mrs M.V. Oshurkova
V.S.E.G.E.I.
Sredni pr. 74
199106 St Petersburg
RUSSIA

Dr Vladimir N. Pazukhin
Inst. Geology
Uralian Res. Center
Russian Academy of Sciences
Ufa
RUSSIA

Dr L.N. Peterson
Krasnoyarskgeolsyomka
ul. Beresina, 3
660020 Krasnoyarsk
RUSSIA

Dr A.V. Popov
Leningrad University
16 Linia, 29
199178 St Petersburg
RUSSIA

Dr B.V. Poyarkov
Moskovsky prospekt 163 kv. 639
150057 Yaroslavl
RUSSIA

Dr S.T. Remizova
Inst.Geol., Komi Scientific Centre
ul. Pervomajskayja 54
167000 Syktyvkar
Komi Republic
RUSSIA
Fax: 821-2-42-53-46
Email: kirul@rol.ru

Dr Yuriy V. Savitsky
St Petersburg State University
Geological Faculty
16 Linia, 29
199178 St Petersburg
RUSSIA

Dr R.A. Schekoldin
Dept of Historical Geology
Mining Institute, 21st line V.O. 2
199106 St Petersburg
RUSSIA
Fax: 812-213-26-13
Email: benin@sovam.com

Dr O.A. Shcherbakov
Polytechnical Institute
Komsomolskiy Avenue 29a
614600 Perm
RUSSIA
Email:
geology@pstu.ac.ru

Dr M.V. Shcherbakova
Polytechnical Institute
Komsomolskiy Avenue 29a
614600 Perm
RUSSIA

Dr V. Tchizhova
V.N.I.I.neft
I Dmitrovsky proezd 10
125422 Moscow
RUSSIA

Dr Alexander P. Vilesov
Geological Faculty
Perm State University
u1. Bukireva 15
614600 Perm
RUSSIA
Email: geology@pstu.ac.ru

SLOVENIA

Dr Matevz Novak
Geological Survey of Slovenia
Dimiceva 14
SI - 1000 Ljubljana
SLOVENIA
Fax: 386-01-2809753
Email:
matevz.novak@geo-zs.si

Dr A. Ramovs
Katedra za geologijo in paleontologijo
Askerceva 2
SLO-1000 Ljubljana
SLOVENIA
Fax: 386-61-1259-337

SOUTH AFRICA

Dr Colin MacRae
Palaeont.Sect.,Geological Survey
Private Mail Bag X112
Pretoria 0001
SOUTH AFRICA

Mr Barry Millsteed
Palaeont.Sect.,Geological Survey
Private Mail Bag X112
Pretoria 0001
SOUTH AFRICA
Fax: 012-841-1278
Email:
bmillstd@geoscience.org.za

Dr J.N. Theron
Geological Survey
P.O. Box 572
Bellville 7535
SOUTH AFRICA

SPAIN

Dr A. García-Loygorri
Cátedra de Geología
Escuela Sup. Ing. Minas
Ríos Rosas 21
28003 Madrid
SPAIN

L.F. Granados
Avda Juan Andrés 10bis
28035 Madrid
SPAIN

Dr M.L. Martinez Chacón
Depto de Geología
Universidad de Oviedo
Arias de Velasco s/n
33005 Oviedo
SPAIN
Fax: 34-98-510-3103
Email:
mmchacon@asturias.geol.uniovi.es

Dr Sergio Rodríguez
Depto de Paleontología
Facultad de Ciencias Geológicas
Ciudad Universitaria
28040 Madrid
SPAIN
Fax: 1-394-4854
Email:
sergrodr@eumax.sim.ucm.es

Dr L.C. Sánchez de Posada
Depto de GeologRa
Universidad de Oviedo
Arias de Velasco s/n
33005 Oviedo
SPAIN
Fax: 34-98-510-3103
Email:
lposada@asturias.geol.uniovi.
es

Dr Elisa Villa
Depto de Geología
Universidad de Oviedo
Arias de Velasco s/n
33005 Oviedo
SPAIN
Fax: 34-98-510-3103
Email: evilla@geol.uniovi.es

Dr R.H. Wagner
Centro Paleobotánico
Jardín Botánico de Córdoba
Avenida de Linneo s/n
14004 Córdoba
SPAIN
Fax: 34-57-295-333
Email:
cr1wagro@uco.es

TARTARSTAN

Dr V.S. Gubareva
ul. Kosmonavtov 7 kv. 7
420061 Kazan
TARTARSTAN

THE NETHERLANDS

Dr O.A. Abbink
Department of Geo-Environment
Section Paleo-Environmental Research
NITG TNO: National Geological Survey
P.O. Box 80015
3508 TA Utrecht
THE NETHERLANDS

Bibliotheek Palaeobotanie
Lab. Palaeobotany and Palynology
Budapestlaan 4
3584 CD Utrecht
THE NETHERLANDS
Fax: 31-30-253-5096
Email: Z.Smeenk@bio.uu.nl

Dr A.C. van Ginkel
Nationaal Natuurhistorisch Museum
Postbus 9517
NL-2300 RA Leiden
THE NETHERLANDS

Dr W. Khrschner
Lab. Palaeobotany & Palynology
Budapestlaan 4
NL-3584 CD Utrecht
THE NETHERLANDS

Subcommissie Stratig. Nederland
Nationaal Natuurhistorisch Museum
Postbus 9517
NL-2300 RA Leiden
THE NETHERLANDS

Dr C.F. Winkler Prins
Nationaal Natuurhistorisch Museum
Postbus 9517
NL-2300 RA Leiden
THE NETHERLANDS
Fax: 31-71-5687666
Email: winkler@naturalis.nnm.nl

TURKEY

Prof. Dr Demir Altiner
Department of Geological Engineering
Middle East Technical University
06531 Ankara
TURKEY
Fax: +90-312-2101263
Email: altiner@tubitak.gov.tr
demir@metu.edu.tr

Dr Cengiz Okuyucu
MTA Genel Mudurlugu
Jeoloji Etutleri Dairesi
06520 Balgat-Ankara
TURKEY
Email: okuyucu@mta.gov.tr

UNITED KINGDOM

Acquisitions
Department of Library Service
The Natural History Museum
Cromwell Road
London SW7 5BD
UNITED KINGDOM

Dr R.L. Austin
21 Bellevue Road
West Cross, Swansea
South Wales SA3 5QB
UNITED KINGDOM

Dr C.J. Cleal
Department of Botany
National Museum & Gallery of Wales
Cathays Park
Cardiff CF1 3NP
UNITED KINGDOM
Fax: 01222-239-829
Email:
100015.567@compuserve.com

Dr R.M.C. Eagar
23 High Bond End
Knaresborough
North Yorks HG5 9BT
UNITED KINGDOM
Fax: 01423-865-892
Email:
100305.1736@compuserve.com

Dr Mark Hounslow
Centre for Environmental Magnetism and Palaeomagnetism,
Lancaster Environment Centre,
Geography Department,
Lancaster University,
Bailrigg, Lancaster, LA1 4YW
UNITED KINGDOM
Fax: 44 (0) 1524 847099
Email: m.hounslow@lancaster.ac.uk

Dr G.A.L. Johnson
Department of Geology
University of Durham
Durham DH1 3LE
UNITED KINGDOM

Dr Duncan McLean
Palynology Research Facility
University of Sheffield
Dainton Building
Brook Hill
Sheffield S3 7HF
UNITED KINGDOM
Email: d.mclean@sheffield.ac.uk

Mr M. Mitchell
11 Ryder Gardens
Leeds, W. Yorks. LS8 1JS
UNITED KINGDOM

Dr B. Owens
Langdale
14th Park Avenue,
Plumtree Park
Nottingham NG12 5LU
UNITED KINGDOM

Dr N.J. Riley
British Geological Survey
Keyworth
Nottingham NG12 5GG
UNITED KINGDOM
Fax: 44-115-9363200
Email: n.riley@bgs.ac.uk

Dr A.R.E. Strank
British Petroleum Res.Centre
Chertsey Rd, Sunbury-on-Thames
Middlesex TW16 7LN
UNITED KINGDOM

Dr N. Turner
British Geological Survey
Keyworth
Nottingham NG12 5GG
UNITED KINGDOM

Dr W.J. Varker
Department of Earth Sciences
The University of Leeds
Leeds LS2 9JT
UNITED KINGDOM

Dr Colin N. Waters
British Geological Survey
Keyworth
Nottingham NG12 5GG
UNITED KINGDOM

Prof. V.P. Wright
Department of Earth Sciences
University of Cardiff
Cardiff CF1 3YE
UNITED KINGDOM
Fax: 01222 874326

Email: wrightvp@cardiff.ac.uk

U.S.A.

Dr Thomas Algeo
Department of Geology
University of Cincinnati
Cincinnati, OH 45221-0013
U.S.A.
Email: Thomas.Algeo@uc.edu

Dr James E. Barrick
Department of Geosciences
Texas Tech University
Lubbock, TX 79409-1053
U.S.A.
Email: ghjeb@pop.ttu.edu

Dr Jack D Beuthin
Department of Geology
Univ. of Pittsburgh-Johnstown
Johnstown, PA 15904
U.S.A.
Email: beuthin@pitt.edu

Mitch Blake
West Virginia Geological Survey
1 Mont Chateau Road
Morgantown, WV 26508-8079
U.S.A.
Email: blake@geosrv.wvnet.edu

Dr Darwin R. Boardman
School of Geology
Oklahoma State University
105 Noble Research Ctr.
Stillwater, OK 74078
U.S.A
Email: darwin.boardman@okstate.edu

Dr Paul Brenckle
1 Whistler Point Road,
Westport, MA 02790
U.S.A.
Email:
saltwaterfarm1@cs.com

Dr D.K. Brezinski
Maryland Geological Survey
2300 St Paul Street
Baltimore, MD 21218
U.S.A.

Dr Lewis M. Brown
Department of Geology
Lake Superior State University
Sault Sainte Marie,
MI 49783-1699
U.S.A.
Email:
lbrown@lakers.lssu.edu

Dr D.R. Chesnut
Kentucky Geological Survey
228 Min.Res.Bldg,
University of Kentucky
Lexington, KY 40506-0107
U.S.A.
Email: chesnut@ukcc.uky.edu

Dr William C. Darrah
2235 Baltimore Pike
Gettysburg, PA 17325
U.S.A.

Dr Vladimir I. Davydov
Dept. Geosciences
Boise State University
1910 University Drive
Boise, ID 83725
U.S.A.
Email:
vdavydov@boisestate.edu

Dr Lewis S. Dean
Library
Geological Survey of Alabama
P.O. Box 869999
420 Hackberry Lane
Tuscaloosa, AL 35486
U.S.A.
Email: library@gsa.state.al.us

Dr J.T. Dutro Jr
5173 Fulton St. NW
Washington, DC 20016
U.S.A.
Email: dutro.tom@simnh.si.edu

Dr Cortland Eble
Kentucky Geological Survey
228 Min.Res.Bldg, Univ. Kentucky
Lexington, KY 40506-0107
U.S.A.

Dr F.R. Ettensohn
Dept. of Geological Sciences
University of Kentucky
101 Slone Building
Lexington, KY 40506-0053
U.S.A.
Email: fettens@uky.edu

Dr Robert Gastaldo
Dept. of Geology
Colby College
Waterville, ME 04901
U.S.A.

Geology Library
The University of Iowa
136 Trowbridge Hall
Iowa City, IA 53342-1379
U.S.A.

William H. Gillespie
U.S. Geological Survey
916 Churchill Circle
Charleston, WV 25314-1747
U.S.A.

Dr Brian F. Glenister
Department of Geoscience
121 Trowbridge Hall
University of Iowa
Iowa City, IA 52242-1379
U.S.A.
Email: brian.glenister@uiowa.edu

Dr Ethan Grossman
Dept. of Geology & Geophysics
Texas A&M University
College Station, TX 77843-3115
U.S.A.
Email: e-grossman@tamu.edu

Dr John Groves
Dept. of Earth Sciences
University of Northern Iowa
Cedar Falls, IA 50614
U.S.A.
Email: John.Groves@uni.edu

Dr Philip H. Heckel
Department of Geoscience
University of Iowa
Iowa City, IA 52242
U.S.A.
Email: philip-heckel@uiowa.edu

Dr Peter Holterhoff
ExxonMobil Upstream
Research Company
ST-4102
P.O. Box 2189
Houston, TX 77252-2189
U.S.A.
Email:
peter.holterhoff@exxonmobil.com

Dr John Isbell
Department of Geosciences
Univ. of Wisconsin-Milwaukee
P.O. Box 413
Milwaukee, WI 53201
U.S.A.
Email: jisbell@csd.uwm.edu

Dr Thomas W. Kammer
Dept. Geology and Geography
West Virginia University
P.O. Box 6300
Morgantown, WV 26506-6300
U.S.A.
Email: tkammer@wvu.edu

Claren M Kidd
100 E Boyd R220
University of Oklahoma
Norman, OK 73019-0628
U.S.A.
Email: ckidd@uoknor.edu

Dr Norman R. King
Dept. of Geosciences
University of Southern Indiana
Evansville, IN 47712
U.S.A.
Email: nking@usi.edu

Albert Kollar
Carnegie Museum of Natural History
Invertebrate Paleontology
4400 Forbes Ave
Pittsburgh, PA 15213
U.S.A.
Email:
KollarA@CarnegieMuseums.Org

Ms Andrea Krumhardt
Dept of Geology & Geophysics
University of Alaska
P.O. Box 755780
Fairbanks, AK 99775
U.S.A.
Email: fnapk@aurura.alaska.edu

Dr Lance Lambert
Earth and Environmental Sciences, Univ. of Texas at San Antonio,
San Antonio,TX 78249
U.S.A.
Email: lance.lambert@utsa.edu

Dr H. Richard Lane
National Science Foundation
4201 Wilson Blvd., Room 785
Arlington, VA 22230
U.S.A.
Email: hlane@nsf.gov

Dr Ralph L. Langenheim
Dept Geol.,Univ. of Illinois
254 N.B.H.,1301 W. Green St.
Urbana, IL 61801
U.S.A.

Dr R.L. Leary
Illinois State Museum
Research & Collections Center
1011 East Ash Street
Springfield, IL 62703
U.S.A.
Email: Leary@museum.state.il.us

Dr Spencer G. Lucas
New Mexico Museum
of Natural History
1801 Mountain Road N.W.
Albuquerque, NM 87104
U.S.A.
Email: SLucas@nmmnh.state.nm.us

Dr Richard Lund
Department of Biology
Adelphi University
Garden City, NY 11530
U.S.A.

Dr W.L. Manger
Department of Geology
Univ. of Arkansas
Fayetteville, AR 72701
U.S.A.
Email: wmanger@comp.uark.edu

Dr Gene Mapes
Dept of Envir. & Plant Biology
Ohio University
Athens, OH 45701
U.S.A.

Dr R.H. Mapes
Department of Geology
Ohio University
Athens, OH 45701
U.S.A.

Dr C. G. Maples
Dept. of Geological Sciences
Indiana University
Bloomington, IN 47405
U.S.A.

Charles E. Mason
Dept. of Physical Sciences
Morehead State University
Morehead, KY 40351
U.S.A.
Email: c.mason@morehead-st.edu

Dr Patrick Mulvany
Geological Survey
Missouri DNR
P.O. Box 250
Rolla, MO 65402
U.S.A.
Email:
patrick.mulvany@dnr.mo.gov

Dr Greg Nadon
Dept. of Geological Sciences
Ohio University
Athens, OH 45701
U.S.A.

Dr Hermann W. Pfefferkorn
Department of Geology
University of Pennsylvania
240 S 33rd St.
Philadelphia, PA 19104-6316
U.S.A.
Email: hpfeffer@sas.upenn.edu

Dr John P. Pope
Department of Geology
Northwest Missouri State University
800 University Drive
Maryville, MO 64468
U.S.A.
Email:jppope@nwmissouri.edu

Dr E. Troy Rasbury
Department of Geosciences
SUNY Stony Brook
Stony Brook, NY 11794-2100
U.S.A.
Email:
troy@pbisotopes.ess.sunysb.edu

Dr Carl B. Rexroad
Indiana Geological Survey
611 N. Walnut Grove
Bloomington, IN 47405
U.S.A.
Email: crexroad@indiana.edu

Dr J. G. Richardson
Columbus State Community College
Dept of Physical & Biological Science
550 East Spring Street
Columbus, OH 43215
U.S.A.
Email: jrichard@cscc.edu

Dr C.A. Ross
GeoBioStrat Consultants
600 Highland Drive
Bellingham, WA 98225-6410
U.S.A.
Email:
rossjpr@henson.cc.wwu.edu

Dr June R.P Ross
Dept. Biology,
Biology Building 315
Western Washington Univ.
Bellingham, WA 98225-9160
U.S.A.
Email: rossjpr@henson.cc.wwu.edu

Dr Steven J. Rosscoe
Dept. of Geological Sciences
Hardin-Simmons University
P.O. Box 16164
Abilene, TX 79698-6164
U.S.A.
Email: srosscoe@hsutx.edu

Dr C.A. Sandberg
U.S. Geological Survey
Box 25046, Federal Center, MS 940
Denver, CO 80225
U.S.A.

Dr Matthew Saltzman
Dept. of Geological Sciences
275 Mendenhall Laboratory
Ohio State University
Columbus, OH 43210-1398
U.S.A.
Email: saltzman.11@osu.edu

Dr W. Bruce Saunders
Geology Department
Bryn Mawr College
Bryn Mawr, PA 19010
U.S.A.
Email: wsaunder@brynmawr.edu

Dr Tamra A. Schiappa
Department of Geosciences
Boise State University
1910 University Dr
Boise, ID 83725
U.S.A.
Email: tschiapp@boisestate.edu

Dr Steve Schutter
Murphy Exploration and Production International
550 Westlake Park Blvd.,
Suite 1000
Houston, TX 77079
U.S.A.
Email: steve-schutter@murphyoilcorp.com

Serials Department
Univ. of Illinois Library
1408 West Gregory Drive
Urbana, IL 61801
U.S.A.

Dr Gerilyn S. Soreghan
Geology & Geophysics
University of Oklahoma
100 E. Boyd St.
Norman, OK 73019
U.S.A.
Email: lsoreg@uoknor.edu

Janice Sorensen
Kansas Geological Survey
University of Kansas
Lawrence, KS 66047
U.S.A.

Dr Calvin H. Stevens
Department of Geology,
School of Science
San Jose State University
San Jose, CA 95192-0102
U.S.A.
Email: stevens@geosun.sjsu.edu

Ms Mathilda Stucke
30 Oakland Avenue
West Hempstead, NY
11552-1923
U.S.A.
Email: stucke@adlibv.adelphi.edu

Dr T.N. Taylor
Department of Botany,
Haworth Hall
University of Kansas
Lawrence, KS 66045
U.S.A.
Email: ttaylor@falcon.cc.ukans.edu

Dr T.L. Thompson
Missouri Geological Survey
Box 250
Rolla, MO 65401
U.S.A.

Dr Alan L. Titus
Grand Staircase-Escalante National Monument
190 East Center St.
Kanab, UT 84741
U.S.A.
Email: Alan_Titus@ut.blm.gov

U.S. Geological Survey Library
12201 Sunrise Valley Drive
National Center, MS 950
Reston, VA 20192
U.S.A.

Dr Peter R. Vail
Dept Geol., Rice University
P.O. Box 1892
Houston, TX 77251
U.S.A.

Dr Gregory P. Wahlman
BP America
501 Westlake Park Blvd.
Houston, TX 77079
U.S.A.
Email: wahlmagp@bp.com

Dr Bruce Wardlaw
U.S. Geological Survey
970 National Center
Reston, VA 22092
U.S.A.

Dr J.A. Waters
Department of Geology
West Georgia College
Carrollton, GA 30118
U.S.A.
Email: jwaters@westga.edu

Dr W. Lynn Watney
Kansas Geological Survey
1930 Constant Avenue - Campus West
Lawrence, KS 66047
U.S.A.
Email: lwatney@kgs.ukans.edu

Dr Gary Webster
Department of Geology
Washington State University
Physical Science 1228
Pullman, WA 99164
U.S.A.
Email: webster@wsu.edu

Dr R.R. West
Dept Geol., Thompson Hall
Kansas State University
Manhattan, KS 66506-3201
U.S.A.
Email: rrwest@ksu.edu

Dr Brian Witzke
Iowa Geological Survey
109 Trowbridge Hall
University of Iowa
Iowa City, IA 52242-1319
U.S.A.
Email: bwitzke@igsb.uiowa.edu

Dr David M. Work
Maine State Museum
83 State House Station
Augusta, ME 04333-0083
U.S.A.
Email: david.work@maine.gov

Dr Thomas Yancey
Department of Geology
Texas A&M University
College Station, TX 77843
U.S.A.
Email: yancey@geo.tamu.edu

UKRAINE

Dr N.I. Bojarina
Institute of Geology
Ukrainian Academy of Science
Gonchar Str., 55b
252054 Kiev
UKRAINE

Dr R.I. Kozitskaya
Institute of Geology
Ukrainian Academy of Science
Gonchar Str., 55b
252054 Kiev
UKRAINE

Dr T.I. Nemyrovska
Institute of Geological Sciences
Ukrainian Academy of Sciences
Gonchar Str., 55b
252054 Kiev
UKRAINE
Email: tnemyrov@i.com.ua

Dr V.I. Poletaev
Institute of Geology
Ukrainian Academy of Science
Gonchar Str., 55b
252054 Kiev
UKRAINE

Dr Z.S. Rumyantseva
ul. Vasilovskaja 42, Kv.33
252022 Kiev
UKRAINE

Dr A.K. Shchegolev
Institute of Geology
Ukrainian Academy of Science
Gonchar Str., 55b
252054 Kiev
UKRAINE

Dr N.P. Vassiljuk
Donetskij Politekhn. Inst.
ul. Artema 58
Donetsk
UKRAINE

Mrs M.V. Vdovenko
Institute of Geology
Ukrainian Academy of Science
Gonchar Str., 55b
252054 Kiev
UKRAINE

UZBEKISTAN

Dr Iskander M. Nigmadjanov
ul. G. Lopatina 80, kv. 35
700003 Tashkent
UZBEKISTAN

SUBCOMMISSION ON CARBONIFEROUS STRATIGRAPHY (SCCS) OFFICERS AND VOTING MEMBERS 2004-2008

CHAIR:

Dr Philip H. Heckel
Department of Geoscience
University of Iowa
Iowa City, IA 52242
U.S.A.
Email: philip-heckel@uiowa.edu

VICE-CHAIR:

Dr Geoffrey Clayton
Department of Geology
Trinity College
Dublin 2
IRELAND
Email: gclayton@tcd.ie

SECRETARY/EDITOR:

Dr David M. Work
Maine State Museum
83 State House Station
Augusta, ME 04333-0083
U.S.A.
Email: david.work@maine.gov

OTHER VOTING MEMBERS:

Dr Alexander S. Alekseev
Dept of Palaeont., Geol. Faculty
Moscow State University
119991 Moscow GSP-1
RUSSIA
Email:aaleks@geol.msu.ru

Dr Demir Altiner
Department of Geological Engineering
Middle East Technical University
06531 Ankara
TURKEY
Email: demir@metu.edu.tr

Dr Darwin R. Boardman
School of Geology
Oklahoma State University
105 Noble Research Ctr.
Stillwater OK 74078
U.S.A.
Email: darwin.boardman@okstate.edu

Dr John Groves
Department of Earth Sciences
University of Northern Iowa
Cedar Falls, IA 50614
U.S.A.
Email: John.Groves@uni.edu

Dr Luc Hance
Unité de Géologie,
Université Catholique de Louvain,
3 place Louis Pasteur,
1348, Louvain-la-Neuve,
BELGIUM
Email: hance@geol.ucl.ac.be
luc.hance@skynet.be

Dr Jin Xiao-chi
Institute of Geology
Chinese Academy of Geological Sciences
26 Baiwanzhuang Road
Beijing 100037
CHINA
Email: jinxchi@cags.net.cn

Dr Jirí Kalvoda
Department of Geology and
Paleontology
Masaryk University
Kotlárská 2
61137 Brno
CZECH REPUBLIC
Email: dino@sci.muni.cz

Dr Dieter Korn
Museum für Naturkunde der
Humboldt-Universität zu Berlin
Invalidenstrasse 43
D-10115 Berlin
GERMANY
Email:
dieter.korn@museum.hu-berlin.de

Dr Olga L. Kossovaya
V.S.E.G.E.I.
Sredni pr. 74
199106 St Petersburg
RUSSIA
Email: koss@mail.wplus.net

Dr Elena I. Kulagina
Institute of Geology
Uralian Research Center
Russian Academy of Sciences
Ufa
RUSSIA
Email: kulagina@anrb.ru

Dr Ian Metcalfe
Asia Centre
University of New England
Armidale NSW 2351
AUSTRALIA
Email: imetcal2@une.edu.au

Dr T.I. Nemyrovska
Institute of Geological Sciences
Ukrainian Academy of Sciences
Gonchar Str., 55b
252054 Kiev
UKRAINE
Email: tnemyrov@i.com.ua

Dr Svetlana Nikolaeva
Paleontological Institute
Russian Academy of Sciences
Profsoyuznaya 123
117868 Moscow GSP
RUSSIA
Email: 44svnikol@mtu-net.ru

Dr B.C. Richards
Geological Survey of Canada
3303-33rd St. N.W.
Calgary AB, T2L 2A7
CANADA
Email: brichard@NRCan.gc.ca

Dr N.J. Riley
British Geological Survey
Keyworth
Nottingham NG12 5GG
UNITED KINGDOM
Email: N.Riley@bgs.ac.uk

Dr Katsumi Ueno
Dept. Earth System Science
Faculty of Science
Fukuoka University,
Jonan-ku, Fukuoka 814-0180
JAPAN
Email: katsumi@fukuoka-u.ac.jp

Dr Elisa Villa
Depto de Geología
Universidad de Oviedo
Arias de Velasco s/n
33005 Oviedo
SPAIN
Email: evilla@geol.uniovi.es

Dr Wang Xiang-dong
Nanjing Institute of Geology and Palaeontology
Chinese Academy of Sciences
39 East Beijing Road
Nanjing 210008
CHINA
Email: xdwang@nigpas.ac.cn