North American forms

1. Pr. marblensis
2. Pr. prisca
3. Pr. fittsi
4. Pr. pararhomboides
5. Pr. walnutensis
6. Pr. parva
7. Pr. copiosa
8. Pr. rotundata

Eurasian forms

SCCS

I.U.G.S. SUBCOMMISSION ON CARBONIFEROUS STRATIGRAPHY
Table of Contents

CHAIRMAN’S COLUMN ...................................................................................................................... 1  
SECRETARY / EDITOR’S REPORT 2006-2007 .............................................................. 1  
SCCS ANNUAL REPORT 2006 .............................................................................................. 2  
TASK/PROJECT GROUP REPORTS ............................................................................................. 5  
  Report of the Task Group to establish a GSSP close to the traditional  
  Tournaisian-Viséan boundary ................................................................................................. 5  
  Report of the Task Group to establish a GSSP close to the traditional  
  Viséan-Serpukhovian boundary ............................................................................................ 5  
  Report of the Task Group to establish a GSSP close to the existing  
  Bashkirian-Moscovian boundary ............................................................................................ 6  
  Report of the Task Group to establish the Moscovian-Kasimovian  
  and Kasimovian-Gzhelian boundaries .................................................................................. 7  
CONTRIBUTIONS BY MEMBERS .............................................................................................. 8  
  Afanasievo section – neostratotype of Kasimovian Stage (Upper Pennsylvanian Series), Moscow  
  Basin, central Russia (Goreva et al.) ...................................................................................... 8  
  Carboniferous Conference Cologne 2006 – From Platform to Basin:  
  A research and field conference sponsored by SEPM-CES (Aretz and Herbig) .................. 14  
  The Carboniferous of Germany (Herbig) ................................................................................ 15  
SCCS VOTING & CORRESPONDING MEMBERSHIP 2007 ................................................ 17  
SCCS OFFICERS AND VOTING MEMBERS 2004-2008 ..................................................... 26
This past year has seen more progress in the selection of stage boundaries, as is detailed in the individual reports that follow. The **Tournaisian-Viséan boundary Task Group** has made minor adjustments to its formal GSSP proposal for the Pengchong section in southern China prior to submittal for the Subcommission vote. The **Viséan-Serpukhovian Boundary Task Group** is further evaluating the conodont lineage *Lochria nodosa – Lochria ziegleri*, which is fairly widely distributed across Eurasia. A potential candidate section for the GSSP reported by Russian workers from the eastern slope of the southern Urals in 2005 is undergoing further detailed study. In addition, several workers are studying various sections across the boundary interval in North America to search for other biostratigraphically useful fossils and to acquire C-isotope data, in order to try to bracket the boundary there so that correlation can be established in case the *Lochria* lineage is not discovered in that region. The **Bashkirian–Moscovian Boundary Task Group** continues more detailed investigation of two conodont lineages, involving the first appearances of *Idiognathodus postulcatus* and *Declinognathodus donetzianus*. Discovery of a new section with the latter taxon beyond its previously known limits has been reported from the southern Urals, and it might be a potential GSSP candidate. In addition, several members are developing a proposal for considering the first appearance of the conodont *Diplognathodus ellesmerensis*, which appears to have an even more widespread distribution than the other lineages. 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 charts across both boundaries that are based on the scales of glacial-eustatic cyclothems plus conodont and fusulinid biostratigraphy. These charts appeared initially in the 2005 Newsletter, and an updated article will be published in the July 2007 issue of *Geology*. The task group reached nearly unanimous consensus 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. A potential GSSP candidate section for this boundary has been proposed in the marine slope deposits at Usolka in the southern Urals. Marine slope deposits are also known in southern China, where preliminary work on the conodont succession at the Nashui roadcut near Luodian in Guizhou Province, published in 2003, shows an apparently complete slope succession extending from late Mississippian through the entire Pennsylvanian and into the Lower Permian. Further detailed work at this section may provide the basis for several GSSP candidates for the remaining stage-boundary stratotypes.

**ICCP 2007: XVI International Carboniferous-Permian Congress in Nanjing**

The XVI International Carboniferous-Permian Congress will take place June 21-24, 2007, in Nanjing, China. We will have a Carboniferous Workshop with task group meetings, reports of the Boundary Task Groups, and an SCCS meeting at the Congress. Two of the post-congress field trips will visit localities with great interest for proposed and potential Carboniferous stage-boundary GSSPs in southern China. One will visit the proposed Tournaisian-Viséan boundary stratotype at Pengchong in western Guangxi Province. The other will visit the Nashui roadcut in Guizhou Province, which exposes the complete late Mississippian through Pennsylvanian section that may provide candidates for several of the remaining boundary stratotypes.

**SCCS Newsletter Funding**

The serious problem that I described last year regarding the funding for printing and distributing this Newsletter has been partially alleviated by an increase in contributions from several additional generous members than previously, for which I am very grateful. However, due to further cutbacks in IUGS/ISC support, we are still facing a potential shortfall in funding for future publication of the Newsletter. Therefore, I again strongly urge all those of you who are able, to make as generous a donation as you can afford, in order to ensure the continuing publication of the Newsletter. Please use the form that is inserted into the Newsletter, for making your donation. Thank you very much.

**Philip H. Heckel**

June, 2007

**SECRETARY / EDITOR’S REPORT**

**2006-2007**

I want to thank all who provided articles for inclusion in Volume 25 of the Newsletter on Carboniferous Stratigraphy. I am indebted to P. H. Heckel for editorial assistance; and to P. Thorson Work for coordinating the compilation of this issue.

**Future Issues of Newsletter on Carboniferous Stratigraphy**

Next year’s Volume 26 will be finalized by July 2008, and I request that all manuscripts be sent before May 31—but preferably earlier. Please read the section below (page 4) regarding submission format, especially manuscript length (no more than 5 double-spaced manuscript pages without prior approval). Finally, I would be most grateful if all voting and corresponding members of the SCCS would let me know of any changes to their mailing and e-mail addresses so that we can update our records.

**David M. Work**

**CHAIRMAN’S COLUMN**
SCCS ANNUAL REPORT 2006

Membership

The Subcommission had 21 voting members in 2006 [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 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 2006 and Early 2007

The final adjustments have been made to the GSSP proposal for the Tournaisian-Viséan boundary. 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 lineages, mostly among conodonts. The remaining proposals are now under intensive discussion and have engendered much further research in several areas on the lineages and also on potential candidates for GSSPs for at least two of the boundaries. The event marker for the Kasimovian-Gzhelian boundary was voted by the task group to be placed at the first appearance of the conodont Idiognathodus simulator (Ellison 1941) [sensu stricto].

The Newsletter on Carboniferous Stratigraphy, Volume 24, published in July 2006, contains reports of the task groups for 2005-6 and 9 articles on various topics of interest, including: The Dombar Limestone in the south Urals and the Viséan-Serpukhovian boundary; Succession and correlation of Viséan floras of the equatorial belt; Pennsylvanian fern taxonomy; new approach through the compact model; Discovery of potential Bashkirian-Moscovian boundary marker conodont Declinognathodus donetzianus in south Urals; Fusulinoidae of Kasimovian-Gzhelian transition in northern Timan; Potential candidate for GSSP to define base of global Gzhelian Stage at Usolka section in south Urals; Conodont and ammonoid distribution across position of proposed Kasimovian-Gzhelian boundary in lower Virgilian strata in Midcontinent North America; Latest calibration of Middle to Late Pennsylvanian timescale using succession of Midcontinent cyclothems; Kasimovian and Gzhelian (Upper Pennsylvanian) conodont zonation in Russia, for a total of 53 pages.

Work Plan for 2007 and Following Years

The SCCS is looking forward to the XVI International Carboniferous-Permian Congress in Nanjing, China, in late June of 2007, where there will be meetings of the task groups at a Carboniferous workshop, and the traditional meeting of the SCCS, along with several field trips. One field trip (C2) will visit the proposed Tournaisian-Viséan boundary stratotype GSSP at Pengchong in western Guangxi Province. Another field trip (C3) will visit the Nashui roadcut near Luodian in southern Guizhou Province, which exposes a succession from late Mississippian through the entire Pennsylvanian and into the Lower Permian, and thus may provide candidates for several of the remaining boundary stratotype GSSPs.

Tournaisian-Viséan boundary. This task group has now adjusted the final details in the formal proposal for the GSSP at the Pengchong section in southern China, for a late 2007 SCCS ballot on the GSSP, before submittal to the ICS and IUGS.

Viséan-Serpukhovian boundary. This task group has agreed in principle that the conodont lineage Lochria nodosa – Lochria ziegleri provides the most likely boundary-defining event. It is focusing work on other biostratigraphically useful fossils across the boundary in areas where this lineage is not yet found, and on evaluating information from a potential
GSSP section in the eastern slope of the southern Urals that was first presented at the May 2005 Liege meeting.

**Bashkirian-Moscovian boundary.** This task group is now focusing more work on evaluating the proposals for boundary-defining events in the conodont lineages involving the first appearances of *Idiognathoides postsulcatus* and *Declinognathodus donetzianus*, and is considering a new possibility involving the first appearance of *Diplognathodus ellesmerensis*.

**Moscovian-Kasimovian boundary.** This task group will further evaluate the conodont and fusulinid lineages proposed as boundary-defining events, and deal with the taxonomic issues involved in these lineages across the boundary interval. It will utilize the cyclothem-based correlation chart of strata across this boundary interval as one of the bases for evaluation.

**Kasimovian-Gzhelian boundary.** The same task group will further discuss the conodont lineage leading to the appearance of *Idiognathodus simulator* [s.s.], which has been overwhelmingly voted as the boundary-defining event. A potential GSSP candidate at Usolka in the southern Urals has been proposed in the Slovenian journal *Geologija*. Recent taxonomic work on the lineage from *I. aff. simulator to I. simulator* [s.s.] in North America has been submitted for publication. A late 2007 SCCS ballot is anticipated to finalize the boundary-defining event.

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 2008. 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. Increasingly precise ID-TIMS measurements of U-Pb zircon ages of volcanic tuff beds in the southern Urals indicate progress in dating biostratigraphically constrained successions across important boundaries.

---

**STATEMENT OF OPERATING ACCOUNTS FOR 2005/2006**

Prepared by David Work, Secretary

(Definitive accounts maintained in US currency)

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>IUGS-ICS Grant 2006</td>
<td>$800.00</td>
</tr>
<tr>
<td>Donations from Members</td>
<td>1775.00</td>
</tr>
<tr>
<td>Interest</td>
<td>14.41</td>
</tr>
<tr>
<td><strong>TOTAL INCOME</strong></td>
<td><strong>$2589.41</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPENDITURE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Newsletter 24 (printing)</td>
<td>$647.64</td>
</tr>
<tr>
<td>Postage for bulk mailings</td>
<td>548.90</td>
</tr>
<tr>
<td>Mailing/Office Supplies</td>
<td>243.28</td>
</tr>
<tr>
<td>Bank Charges</td>
<td>10.00</td>
</tr>
<tr>
<td><strong>TOTAL EXPENDITURE</strong></td>
<td><strong>$1449.82</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Funds carried forward from 2004 – 2005</td>
<td>$1529.51</td>
</tr>
<tr>
<td>PLUS Income 2005 – 2006</td>
<td>2589.41</td>
</tr>
<tr>
<td>LESS Expenditure 2005 – 2006</td>
<td>-1449.82</td>
</tr>
<tr>
<td><strong>CREDIT balance carried forward to 2007</strong></td>
<td><strong>$2669.10</strong></td>
</tr>
</tbody>
</table>
Donations in 2006/2007:
Publication of the Newsletter on Carboniferous Stratigraphy is made possible with generous donations received from members/institutes during 2006-2007 and anonymous donations, combined with an IUGS subsidy of US $800 in 2006, and additional support from a small group of members who provide internal postal charges for the Newsletter within their respective geographic regions.


COVER ILLUSTRATION
Comparison of North American (top) and Eurasian (bottom) species-pairs of the fusulinid *Profusulinella* Rauser-Chernousova and Belyaev in Rauser-Chernousova et al., 1936. Despite the parallel nomenclature, there are striking morphologic similarities in certain species-pairs of approximately the same age (see Groves et al., 2007 for discussion). Scale bar beneath each image = 0.50 mm.

Illustrations: courtesy of J. R. Groves


CONTRIBUTIONS TO THE NEWSLETTER
The Newsletter 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 accommodated. 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 traditional Tournaisian/Viséan boundary

George Sevastopulo and Task Group
Department of Geology, Trinity College, Dublin 2, Ireland.

The work of the group is almost complete. The major revision of late Tournaisian/early Viséan *Eoparastaffella* spp. by F.-X. Devuyst and Jiri Kalvoda has been published in the *Journal of Foraminiferal Research* (Devuyst and Kalvoda, 2007). Further study of the material from the proposed GSSP at Pengchong, China has lead to the identification of the first *Eoparastaffella simplex* at the base of Bed 83. F.-X. Devuyst and Hou Hongfei visited the section in January and made sure that the base of Bed 83 could be seen in contact with underlying strata. The base of Bed 83 will now be proposed as the Global Stratotype Point. Participants at the ICCP2007 at Nanjing, China will have the opportunity of inspecting the Pengchong section on Field Excursion C2 (Stratigraphy and lithofacies of the Tournaisian and Viséan in the Guilin-Liuzhou area, Guangxi, South China, June 25-28, led by Jin, X.C., Devuyst, F.-X., Hance, L., Poty, E., Yin, B.A., Wu, X.H., Hou, H.F.)


Report of the Task Group to establish a GSSP close to the existing Viséan-Serpukhovian boundary

Barry C. Richards and Task Group
Geological Survey of Canada – Calgary, 3303 - 33rd St. NW, Calgary, Alberta, Canada T2L 2A7.

During the past year, continued progress has been made toward the selection of a GSSP for the Viséan-Serpukhovian stage boundary. In spite of a rigorous search for alternatives, the first evolutionary appearance of the conodont *Lochriea ziegleri* in the lineage *Lochriea nodosa* – *Lochriea ziegleri* still presents the best potential for definition of the Viséan-Serpukhovian 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 near the town of Zaborie in the Moscow Basin. 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 (Nemirovska, 2005). Unfortunately, the lineage has not been reported from North America. Despite that major shortcoming, the first appearance of *L. ziegleri* is an excellent potential marker for the boundary and the task group will vote on either accepting or rejecting it for GSSP definition after the Nanjing Congress on the Carboniferous and Permian.

Task group member Yu-ping Qi and his associates recently recognized the lineage *L. nodosa* – *L. ziegleri* and other lineages within the *Lochriea* group of species in the Nashui section near the town of Luodian in Guizhou Province, southern People’s 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. In the near future, Qi plans to study additional sections containing the lineage in South China.

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. Tamara Nemyrovska plans to complete a detailed study of the conodonts within the *Lochriea* lineage from the locality and from other Uralian sections that Nikolaeva et al. (2005) have been working on. She has the samples and is ready to start working on them.

During 2006, Svetlana Nikolaeva and her colleagues continued work on the Verkhnyaya Kardailovka section and expanded their study of carbonate-dominant, Viséan-Serpukhovian successions to the Dombar Limestone in the nearby Dombar and Kyzl-Shin region of northern Kazakhstan. In the Dombar Limestone, the *Lochriea* lineage occurs with a taxonomically diverse association of extremely abundant ammonoids (Kulagina et al., 2006). The exact position of the ammonoid zones with respect to those based on other groups, particularly conodonts, 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 Viséan ammonoids in the Chainman Shale of western Utah and eastern Nevada may lead to a precise correlation with North America at the proposed level of the Viséan-Serpukhovian stage boundary.

Several task group members, in addition to associate member Sergio Rodríguez from Spain and Wayne Bamber from the Geological Survey of Canada-Calgary, are studying various carbonate-dominant, well-exposed sections across the boundary interval in the upper Viséan to Serpukhovian Etherington Formation in the southern Canadian Rocky Mountains. Rodríguez and Bamber are preparing a monograph on the taxonomically diverse, abundant and well preserved 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.

A multidisciplinary study resembling that of the Etherington project is proceeding 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
calcereous microfaunas and rugose corals in France, Belgium, Germany, and England. It is hoped that through co-ordination, the western Canadian and European coral/microfaunal projects will lead to the discovery of biostratigraphic markers that are either more globally distributed than the Lochriea lineage or can be used to correlate the L. nodosa – L. ziegleri transition between Europe and North America.

Gibshman (2001) and Nikolaeva et al. (2002) list a number of the important foraminiferal taxa appearing at the base of the Serpukhovian in Russia. The foraminifers include Neoarchaediscus prostrigoukos, Janishewskina delicata, and Eolasiodiscus donbassicus. If the Lochriea lineage is eventually used to define the Viséan-Serpukhovian boundary, either Eolasiodiscus donbassicus or possibly one of the other forams appearing at the base of the Serpukhovian in Russia may be useful for locating the base of the Serpukhovian in North America. Task group member Paul Brenckle recently discovered that E. donbassicus occurs in the Chesterian Fraileys Shale of central Kentucky. According to Brenckle, it was identified as Monotaxinoides sp. by Browne and Pohl (1973, pl. 26, figs. 4, 5). Unfortunately, E. donbassicus may be rather rare in North America.

John Utting (Geological Survey of Canada-Calgary) and Peter Giles (Geological Survey of Canada-Atlantic) have been studying the palynostratigraphy and lithostratigraphy of the partially marine late Viséan to terrestrial early Serpukhovian rocks of southwest Newfoundland, Atlantic Canada (Utting and Giles, 2004). The misospecies assemblages recorded enable correlations to be made with spore zones of western Europe, where there is some biostratigraphic control from marine faunas.

Armed with new palynological zonations for the Mississippian of the Maritimes Basin in eastern Canada, Peter Giles and John Utting have recently applied these data to the revision of published magnetic stratigraphy, and are now working with Neil Opdyke (University of Florida) and Vic DiVenere (Long Island University) to expand and refine the polarity stratigraphy of the Late Mississippian. Normal polarity dominates most of the Serpukhovian but several reversals show strong potential for long-range correlation. The Late Viséan record in eastern Canada is dominated by reversed polarity, but as many as seven normal magnetozones can be recognized in the latest Viséan substage alone.

**References**


Preliminary studies by E. Villa, C. Méndez, O. Merino-Tomé, L. C. Sánchez de Posada, and M. L. Martínez-Chacón show that upper Bashkirian strata contain Profusulinella tashliensis, Verella sp., Profusulinella ex gr. primitiva, and the highest observed occurrences of Archaeisidaceae. Beds regarded as lower Moscovian contain Idiognathoides sulcatus, I. aff. altovenesis, Neognathodus atokaensis, Profusulinella sitteri, Verella? sp. (transitional form), Profusulinella prisca, and Tenebrosella asturica. The suspected position of the boundary falls within a covered interval immediately below the latter assemblage. The Spanish research team plans to continue with more detailed work on this section.

Fusulinid-bearing successions across the Bashkirian-Moscovian boundary are present in the South Urals. According to E. Kulagina, the following evolutionary changes can be used to recognize the base of the Moscovian: 1) the development of an almost spherical shell shape in Staffellaeformes – Depratina lineage; and 2) the appearance of primitively fluted septa in the Profusulinella (Tikhonovichiella) tikhonovici – Aljutovella subaljutovica – Skelnevattella skelnevatica and Profusulinella pararhomboides – Profusulinella (T.) pseudoaljutovica – Aljutovella aljutovica lineages.

At the Askyn River section, hypostratotype of the Bashkirian Stage, the base of the Moscovian has been placed traditionally at the base of bed 31 in the Solontsovsky Horizon (Sinitsina and Sinitsin, 1987). The fusulinds Depratina (= Profusulinella prisca, Profusulinella (T.) pseudoaljutovica, Aljutovella cf. subaljutovica, Skelnevattella sp., and Schubertella gracilis) appear approximately 4 m above the base of this horizon. However, Aljutovella aljutovica, a marker for the base of the Moscovian Stage in its type area, occurs about 28 m higher in bed 35. At the Uklykaya and Seryat sections, similar patterns of occurrences have been observed. Declinognathodus donetzianus has been recovered only at the Basu River section (not far from the Askyn River section) with a foraminiferal assemblage similar to that from the lower Solontsovsky Horizon (Pazukhin et al., 2006).

References


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

Elisa Villa and Task Group

 Depto de Geologia 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 simuator (Ellison, 1941) [sensu stricto] first appears be selected to mark the base of the global Gzhelian Stage.

Task Group Activities in 2006.

In July-August 2006, the task group held a field trip to relevant sections in the Carnic Alps and Karavanke Mountains. The three-day trip to the Carnic Alps was led by task group members Holger Forke and Elias Samankassou, in cooperation with Prof. Hans-Peter Schönlaub (Geological Survey of Austria). The excursion to the Karavanke Mountains was guided by Matevz Novak (Geological Survey of Slovenia) and Holger Forke.

After the field trip, a meeting with presentations, workshops, and discussions was held during five days at the Geological Survey of Slovenia in Ljubljana. This meeting was well organized by Matevz Novak, Staša Čertalič, and Bojan Ogorelec (Geological Survey of Slovenia) and was attended by task group members A. Alekseev, V. Davydov, H. Forke, N. Goreva, P. Heckel, T. Isakova, M. L. Martinez Chacón, C. Méndez, T. Nemyrovksa, E. Samankassou, L. C. Sánchez de Posada, K. Ueno, and E. Villa as well as guests from Croatia (J. Sremac), Poland (B. Blazejowski), Serbia (D. Jovanović, M. Sudar), Spain (O. Merino, J. R. Bahamonde), and Slovenia (K. Droba). Dr. Andrej Šmuc (Department of Geology, University of Ljubljana), gave an introductory lecture on the geology of Slovenia.

Substantial progress was made on correlation of cyclothem units across both boundaries, and on definition of the K-G boundary. The task group has generally agreed upon a rather detailed correlation of the glacial-eustatic sequence-stratigraphic units called cyclothem in the regions where they can be recognized in strata across these boundaries, specifically, the Midcontinent U.S., Moscow Basin, and Donets Basin. Cyclothem correlation is supported by biostratigraphy of the conodont and fusuline faunas, and, at certain levels, by ammonoids. These cyclothem correlations are being published by P. Heckel et al. (2007). These biostratigraphic data also allow correlation with sections in those areas where cyclothem are not yet recognized, specifically in the southern Urals, Cantabrian region of northern Spain, and the Carnic Alps. These correlations are shown in charts and text published by P. Heckel and task group members in the 2005 Newsletter on Carboniferous Stratigraphy, which are updated for the Donets Basin by Heckel et al. (2007).

Studies on the Moscovian-Kasimovian and the Kasimovian-Gzhelian Boundaries

With respect the Moscovian-Kasimovian boundary, one of the most promising taxa being considered as a fossil marker is the conodont Idiognathodus sagittalis, although its potential value must still be confirmed using data gathered from ongoing studies. Jim Barrick and his student Steve Roscoe are preparing a manuscript on Idiognathodus morphotypes across the Desmoinesian-Missourian boundary from the Lost Branch through the Hertha cyclothem, which include some forms that resemble I. sagittalis.

July 2007
Other fossils bearing on correlation within the Moscovian-Kasimovian transition beds are *I. subexcelsus* (which links Donets Basin Limestone N3 with the Lower Suvorovo Formation of the Moscow Basin), and *Swadellina nodocarinata* (which links Donets Limestone N3/3, the Voskresensk Formation of the Moscow Basin, and the Lost Branch cyclothem of the Midcontinent). In this scheme, the traditional Lower Kasimovian boundary of Eastern Europe is at a level just below the upper Desmoinesian Farlington cyclothem, but that level is marked by a discontinuity with abrupt appearance of the genus *Swadellina* just above it.

The task group has reached general agreement on the characterization of the Kasimovian-Gzhelian boundary. After a ballot among the 23 task group voting members, the first appearance of the conodont *Idiognathodus simulator* [s.s.] was approved to serve as the fossil marker for the global lower Gzhelian boundary, by a vote of 22 in favor and 1 abstention. This boundary is now placed at a level slightly higher than the base of the regional Virgilian Stage of North America. After North America, the Moscow Basin, the Donets Basin, and to the base of the Oread cyclothem in the Midcontinent, the Moscow Basin, to the base of the Oka Limestone in the Donets Basin, and to the base of the Oread cyclothem in the Midcontinent (therefore, slightly higher than the base of the regional Virgilian Stage of North America).

*I. simulator* [s.s.] has been so far identified in Midcontinent North America, the Moscow Basin, the Donets Basin, and the northern and southern Urals of eastern Europe, as well as in southwestern China. Correlation at this level based on this species can be reinforced in some areas by ammonoid data (first appearance of the oldest species of the genus *Shumardites*, *S. cuyleri*, and of *Vidrioceus uddeni*), and by fusulin data (first appearance of *Rauzertites rossicus*).

### CONSTRUCTIONS BY MEMBERS

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.

**Afanasievo section – neostratotype of Kasimovian Stage (Upper Pennsylvanian Series), Moscow Basin, central Russia**

<table>
<thead>
<tr>
<th>N.V. Goreva¹, A.S. Alekseev², T.N. Isakova¹, and O.L. Kossovaya³</th>
</tr>
</thead>
<tbody>
<tr>
<td>¹Geological Institute of RAS, Moscow, Russia.</td>
</tr>
<tr>
<td>²Moscow State University, Moscow, Russia.</td>
</tr>
<tr>
<td>³All-Russian Geological Research Institute, St. Peterburg, Russia.</td>
</tr>
</tbody>
</table>

**Introduction**

The Kasimovian Stage is the lower stage of the Upper Pennsylvanian Series. It was established in the Moscow Basin not far from Moscow in the early 1920s. Originally it was named by Ivanov (1926) as the *Tegulifera* (later *Teguliferina*) Horizon of the Upper Carboniferous (in the original threefold subdivision of the Carboniferous System), based on occurrence of the typical brachiopod genus. This taxonomic name was changed by Danshin (1947) into the Kasimovian Horizon, and then into the Kasimovian Stage by Teodorovich (1949). Kasimov is a small town in the Ryazan Region, situated about 200 km southeast of Moscow, where the Oka River crosses the Oka-Tsna swell, a narrow uplift of Paleozoic strata. In spite of its name, its type areas are in the vicinity of Voskresensk in the lower extent of the Moscow River for the lower part, and in the Moscow City region for the upper part.

In the southern Moscow Basin, the Kasimovian succession averages about 50 m in thickness, and is composed of distinctly alternating, poorly fossiliferous fine-grained limestones, and variegated marls and shales with thin limestone interbeds. The

### Coming Steps

A detailed report dealing with the topics mentioned above will be presented during the meeting of the IUGS Subcommission on Carboniferous Stratigraphy (SCCS) to be held during the XVI-ICCP in Nanjing (June 2007).

Following acceptance of *I. simulator* as the fossil marker for the base of the global Gzhelian Stage, the next goal for the present task group will be the selection of a GSSP for this level.

In spring 2008, prior to the ICS meeting at the International Geological Congress in Oslo (August 2008), the Task Group to establish the Moscovian-Kasimovian and Kasimovian-Gzhelian boundaries plans to have a Task Group Meeting and Workshop at the University of Oviedo (Spain). This meeting should serve to shape the schedule for the coming years.

### References


interbeds are commonly rich in macrofossils, which provide the main faunal characteristics of the Kasimovian Stage. In thickness, the clayey members constitute about half of the succession.

According to the unified Carboniferous stratigraphic scheme for the Russian Platform approved formally in 1988 (Kagarmanov and Donakova, 1990), the Kasimovian consists of three substages: Krevyakinian, Khamovnikian, and Dorogomilovian. Each unit corresponds either to one provincial or local fusulinid zone or several conodont zones.

The stratotype of the Krevyakinian Substage was in a quarry 5 or 6 km southeast of Voskresensk near the Tsemgigant train station at the Suvorovo quarry. The quarry does not exist now. The stratotypes of the Ratmirovo and Neverovo formations of the Khamovnikian Substage were established in the same region, and now also are destroyed.

At present, the Afanasievo section in the “Voskresensk cement” quarry on the right bank of the Moscow River is the only section where the Krevyakinian and Khamovnikian substages are accessible. For this reason, this section is selected as a neostratotype of the Kasimovian Stage, of its Krevyakinian Substage consisting of the Suvorovo and Voskresensk formations, and of its Khamovnikian Substage consisting of the Ratmirovo and Neverovo formations. The Afanasievo section is located approximately 90 km southeast of Moscow and about 5 km southwest of Voskresensk (Fig. 1).

**Afanasievo Section**

The section at Afanasievo (Figs. 2,3) starts with limestones of the uppermost Moscovian (Upper Myachkovian) Peski Formation (up to 5 m), which are overlain by a shallow-water carbonate succession (18 m) of the Krevyakinian (Suvorovo and

![Fig. 1. Location of Afanasievo section in Moscow Basin.](image)
Voskresensk formations) and the lower part of the Khamovnikian (Ratmirovo, and basal, lower and middle Neverovo formations). This succession was formed under the strong influence of glacio-eustatic sea-level fluctuations, in which the marine units are separated by gaps of different duration.

The Moscovian-Kasimovian transition in the Afnasievo section contains fusulinids, brachiopods, bryozoans, rugose corals, fish remains, and conodonts. Also present as palaeontological rarities, are well preserved ophiuroids and asteroids in the Neverovo Formation.

**Krevyakinian Substage**

The Krevyakinian lies on the distinctly eroded surface of the Myachkovian limestones (Fig. 2), and is composed predominantly of variegated shales. The Suvorovo Formation consists of two members (Beds 9-14), about 5 m in overall thickness. The Voskresensk Formation (Beds 15-33) can also be subdivided into two members, and its thickness varies from 3.5 to 6.5 m. The Ratmirovo Formation of the Khamovnikian (Fig. 2) lies on the eroded surface of the Voskresensk shales. Although weakly expressed lithologically, this gap varies greatly in amplitude. Locally, the upper member of the Voskresensk above Bed 22 is only 0.5 m thick.

**Conodonts.** Many conodont samples were taken from the section (Fig. 2). Each sample was 2 to 5 kg in weight. They yielded a total of more than 11,000 conodont elements, with an average of 100-120 elements per kg. The conodont assemblage of the basal Krevyakinian is essentially different from the Myachkovian assemblage. The difference is pronounced in the complete disappearance of *Neognathodus*, along with the appearance of *Streptognathodus* and *Swadélina* in the basal Krevyakinian. Conodont elements sharply increase in abundance in the Kasimovian relative to the Upper Moscovian, and may exceed 500 specimens per kg.

Characteristic species of the Suvorovo Formation are *Streptognathodus* (“Swadélina?”) *subexcelsus* Alekseev and Goreva, *Idiognathodus fischeri* Alekseev and Goreva, and *I. trigonolobatus* Barskov and Alekseev. The Voskresensk Formation contains highly dominant *Swadélina makhlinae* Alekseev and Goreva as well as *I. trigonolobatus* Barskov and Alekseev. Stratigraphic distribution of these species allows establishment of two conodont zones: the lower one of *S. subexcelsus*, and the upper one of *S. makhlinae* (Alekseev and Goreva, 2000, 2007).

**Fusulinids.** Twelve levels with fusulinids were distinguished in the Afnasievo section from the upper part of the Peski Formation (Moscovian Stage) up to the middle part of the Neverovo Formation (Figs. 2, 3). The Peski contains an assemblage with *Hemifusulina* replaced upward by frequent *Fusulina cylindrica* Fischer, *F. mosquensis* Raus., *F. quasicylindrica* Lee, and forms of the *Fusulinaella fluxa* (Lee and Chen) group. The same forms were assigned to *Fusulinella (?) – conventional Protriticites (?) sp.* (P. ex gr. ovatus).

According to the unified stratigraphic scheme for the Russian Platform, the Krevyakinian corresponds to the *Protriticites pseudomontiparus, Obsoletes obsoletus Zone*. The base is marked by sharp changes in fusulinid assemblage compared to that in the Myachkovian. *Pseudostaflella, Profusulina, and Hemifusulina* disappear. The Suvorovo Formation contains a sparse fusulinid assemblage, which includes the stratigraphically important genera and species *Protriticites subschwagerinoides* Ros. and forms identified as *Obsoletes ex gr. O. obsoletus* (Schell.). The assemblage contains also species of wide stratigraphic range, such as *Fusielia typica ventricosa* Raus., *Schubertella gracilis* Raus., and *Ozawainella mosquensis* Raus. The lower part of the Voskresensk Formation yielded an abundant fusulinid assemblage characterized by typical forms of *Protriticites (Pr. pseudomontiparus* Putrya, *Pr. formosus* Volozh., *Pr. longus* Volozh.) and *Obsoletes (O. magnus* Kir., *O. ex gr. obsoletus* Schell.). It should be noted that some researchers (Ginkel and Villa, 1999) do not regard Obsoletes to be an independent genus.

**Khamovnikian Substage**

The Khamovnikian also comprises two units (Fig. 3). The Ratmirovo Formation consists of very shallow-water white porcellaneous limestones (mudstones) (Beds 34-38) and is about 2 m thick. The Neverovo Formation (Beds 35-39, about 5 m thick) is composed predominantly of shales with limestone interbeds and is subdivided into three members (Basal, Lower, and Middle). In the neostratotype, the Neverovo Formation is incomplete. Only the lower part of the Middle member is present in the Afnasievo section, but to the east in the subsurface, the complete thickness of the Neverovo Formation is 10-12 m.

**Conodonts.** The assemblage of conodonts in the Ratmirovo Formation is sparse and includes mainly shallow-water *Adetognathus*. At the base of the Ratmirovo, along with *S. makhlinae*, a rare juvenile forms occurs that looks similar to *Streptognathodus neverovensis* Goreva and Alekseev. The lower part of the Basal Neverovo contains a similar conodont assemblage. The uppermost Basal and LowerNeverovo contain abundant *Streptognathodus neverovensis*. Along with abundant *Hindeodus* and *Diplognathodus*, there are forms similar to *Idiognathodus trigonolobatus, I.arendti* Barskov and Alekseev, and *I. eccentricus* (Ellison).

*I. sagittalis* Kozitskaya first appears 2 m above the base of the Neverovo Formation in the bottom of the Middle member, where it occurs with *S. neverovensis* and *Idiognathodus trigonolobatus*. In the upper part of the Middle Neverovo, *Gondolella* appears and reflects the progressive deepening of the marine basin.

The appearance of *I. sagittalis* has been proposed recently as the best index-fossil for definition of the base of the Kasimovian in the global stratigraphic scale. A form that can be interpreted as the ancestor of *Idiognathodus sagittalis* was detected in the upper part of the Suvorovo Formation, but it is more abundant and more advanced in the middle and upper Voskresensk Formation. We identified it as *Idiognathodus sp. nov. N*. This lineage can be considered as a prospect for fixing the GSSP at the level of first appearance of *I. sagittalis*.

**Fusulinids.** Fusulinids first appear in the uppermost part of the Ratmirovo Formation, and the Ratmirovo–Neverovo boundary interval is characterized by a single assemblage.

**Carboniferous Newsletter**
Fig. 2. Distribution of conodonts and fusulinids in uppermost Moscovian – Krevyakinian interval of Afanasievo section.
Fig. 3. Distribution of conodonts and fusulinids in Khamovnikiyan interval of Afanasievo section.
Characteristic forms are typical (in wall structure) Protriticites (P. pseudomontiparus, P. subtschwarzguioides, P. aff. subovatus), rare specimens with transitional wall structure from Protriticites to Montiparus, and a few Montiparus paramontiparus.

The assemblage of the Basal Neverovo Formation is noticeably renewed. It comprises Montiparus paramontiparus Ros., Protriticites subovatus Bensh, Pr. subtschwarzguioides Ros., and Pr. pseudomontiparus Pr. The Lower member of the Neverovo contains a diverse fusulinid assemblage, which is distinguished by co-occurrence of typical Montiparus (M. montiparus (Moeller), M. umbonophilicus Raus. and Bel.) and typical Protriticites. The Middle member of the Neverovo is marked by the presence of Quasifusulina (Q. longissima Moel., Q. eleganta Shlyk., Q. dagmarae Prut. dominating forms) and Ozawaiella. Above, there are prevailing Montiparus montiparus (Moeller) and M. subcerassus Ros. The Montiparus forms are widely variable.

The first appearance of I. sagittalis is very close to the entrance of the typical Kasimovian fusulinid Montiparus.

Macrofauna. The studied interval of the Afanasievo section is also characterized by diverse macrofauna: rugose corals, brachiopods, and bryozoans. Six levels with rugose corals were established.

The sparse rugose assemblage of the Kreva hydraulic includes a few taxa that survived after the diversity decrease during the late Myachkovian. There is Bothryphylum conicum (Fisher), which occurs with Bothryphylum pseudoconicum (Dobrolyubova) with widely distributed dissepiments. Few corals are found at the base of the Ratmirovo Formation (Bothroscilis sp. 1) and the Basal Neverovo (Bothryphylum pseudoconicum). Corals become more diverse in the Middle Neverovo, where Bothryphylum conicum and B. rareseptatum (Dobrolyubova) were found, and in its upper part where small fasciculate colonies of Fomichevella sp. nov. 1 appear (Beds 55-56).

The Lower and especially Middle Neverovo are characterized by an abundant and diverse brachiopod assemblage: Admoskavia ivanorum Lazarev, Neochonetes carboniferous (Keys.), Kozlowskia borealiformiss Lazarev, and other species were found one meter above the base.

Goryunova (2000) reported the bryozoans Crustoparella alekseevi Goryunova, Rectifacetella constans (Schulga-Nesterenko) and Polyoprella martis (Fischer) from the Vaskevusk shale, and Pseudorhabdomeson polygonium Goryunova and Crustoparella sakharovensis Goryunova were detected 0.5 and 4 m above the base of the Neverovo.

Lower Boundary of the Kasimovian.

The position of the basal Kasimovian boundary in the type area has been a subject of numerous revisions (Makhlina et al., 2001a). In the late 1970s, the Middle-Upper Carboniferous boundary was established at the base of the Suvorovo Formation of the Kreva hydraulic. This level conventionally coincided with a base of the fusulinid zone of Protriticites pseudomontiparus, Obsoletes obsoletus, which is the lower zone of the Upper Carboniferous and first distinguished by Semikhatova (1947) in Donskaya Luka as the “subtriticites” Beds. In the last decade, work was intensified to define markers of the lower Kasimovian boundary and to find sections where a reliable phylogenetic succession can be traced, and where, owing to a complex of its properties, the GSSP for this boundary can be established.

It was discovered that the conodont J. sagittalis has a high potential for correlation of the lower Kasimovian boundary. It occurs in the Donets Basin (Ukraine), Moscow Basin and South Urals (Russia), Cantabrian Mountains (Spain), Midcontinent USA, northern Canada, and South Korea. Owing to evident morphological characters, this species is easy to identify. In the Afanasievo section, it appears first in the base of the Middle Neverovo Formation of the Khamovnikian, i.e., much higher than the Kasimovian base that was established in 1971. The supposed ancestor of I. sagittalis appears in the upper part of the Suvorovo Formation and becomes abundant and more advanced in the upper members of the Voskresensk Formation. This evolutionary line is promising for establishing the GSSP at the level of first appearance of I. sagittalis. If this species is selected as the marker, the Kasimovian base will be approximately coincident with first appearance of fusulinid genus Montiparus.

Data on oxygen and carbon isotope ratios derived from the Afanasievo carbonates is unsuitable because of strong diagenetic changes during repeated sea-level drops (data of W. Buggisch, personal communication). Oxygen isotope composition of conodont phosphate demonstrates sharp cyclic variations reflecting glacio-eustatic fluctuations (data of M. Joachimski, personal communication).

The Afanasievo section can be considered as a possible candidate for the stratotype of the lower Kasimovian boundary. The most correlative levels are at the base of the Montiparus montiparus fusulinid Zone and at the base of the Idiognathodus sagittalis conodont Zone. Advantages of the Afanasievo section as a stratotype of the lower boundary of the Kasimovian Stage are as follows: geographic accessibility, refined characterization by conodonts and fusulinds, diverse macrofauna (rugose corals, bryozoans, ostracodes), obtained results of isotopic analysis, and high potential for correlation with Eurasian sections. The disadvantage of this section is constituted by the shallow-water facies that consequently include gaps of uncertain duration, particularly between the Peski and Suvorovo, Suvorovo and Voskresensk and the Ratmirovo and Neverovo formations.

References


Danshin, B.M. 1947. Geologic structure and minerals of Moscow and its environs. Moscow Society of Naturalists Press,

July 2007
Carboniferous Conference Cologne 2006 – From Platform to Basin: A research and field conference sponsored by SEPM-CES

Markus Aretz and Hans-Georg Herbig

Institut für Geologie und Mineralogie, Universität zu Köln, Zülpicher Str. 49a, 50674 Köln, Germany.

Almost 100 people from 19 countries including Mexico, the U.S.A., and Canada, many European countries, northern Africa, the Middle East, China, and Australia, attended the symposium “CCC 2006 – From Platform to Basin”, which convened 4-10 September 2006 in our department in Cologne. The conference included two pre- and post-meeting field trips, each two days long, as well as 46 oral and 35 poster presentations and gives a representative insight into the activities of the Carboniferous community. The headings of the sessions, which were opened by keynotes, show the main topics addressed.

- Facies patterns: platforms, basins, and their interfaces (Keynote: E Poty, Liège: Sequence stratigraphic model for the Belgian Dinantian: from local to global).
- Diagenesis and hydrocarbon reservoirs (Keynote: W.M. Ahr, College Station/Texas: Hydrocarbon reservoirs in Carboniferous carbonates).
- Multistratigraphy, sequence stratigraphy, and eustacy (Keynote: I.D. Somerville, Dublin: Multistratigraphic correlation of platforms and basins in the Mississippian (Carboniferous)).
- Interrelationships of geochemical proxies, facies, and fauna (Keynote: J. Veizer, Ottawa: Climate, water, and carbon cycles on geological time scales).
- Bioconstructions and bioconstructors (Keynote: G.E. Webb, Brisbane: Environmental constraints on Mississippian bioconstructors in different platform to basin transects: fore-arc setting, eastern Australia and passive margin ramp, Sacramento Mountains, New Mexico).

The complete program listing all talks and posters is available from http://www.ccc2006.uni-koeln.de/programm_ccc.pdf. Extended abstracts, up to two pages in length, were published in a volume, which can be purchased from the organizers (25 Euros).

The proceedings of the meeting, to be published in Geological Journal, are scheduled for early 2008.

The field trips focused on the central theme of the congress and presented a state-of-the-art overview of the carbonate platform facies of the easternmost part of the northwest European “Carboniferous Limestone” province, transition into basin, and basinal facies (“Kulm facies”) of the classical central European Mississippian in the eastern Belgian Ardennes and in the German Rheinisches Schiefergebirge. Two voluminous field guides were prepared, which include much new, previously unpublished information. This concerns especially the Mississippian of the Aachen region, westernmost Germany, and approaches to facies, sea level, and sequence stratigraphy, respectively, within the Rheinhercynian Kulm Basin. The contents of the as yet unpublished field guides have subsequently been revised and improved, in part as a result of discussions generated by participants of the field trips. These should be available at the end of the summer as volume 16 of Kölner Forum für Geologie und Paläontologie.

The positive responses of the participants suggest that CCC 2006 was a successful meeting, enjoyed by participants and organizers alike. Therefore, we envisage that the series of meetings, which started with European Dinantian Environments (Manchester 1984), followed by European Dinantian Environments II (Dublin 1994), and Permocarboniferous Carbonate Platforms and Reefs (El Paso 2000) might be successfully continued.


Aretz, M., E. Poty, and H.-G. Herbig (with contributions by S. Delculée and P. Hecker). 2007. From palaeokarst to calcitur-
The Carboniferous of Germany

Hans-Georg Herbig

Institut für Geologie und Mineralogie, Universität zu Köln, Zülpicher Str. 49a, 50674 Köln, Germany.

The German Commission on Stratigraphy is currently editing a series of 20 volumes dealing with the Proterozoic to Quaternary Systems of Germany. Nine volumes are currently available (http://www.stratigraphie.de/monographie/index.html). Two volumes, prepared under the guidance of the German Subcommission on Carboniferous Stratigraphy, present a detailed overview of the stratigraphy, paleontology, and regional geology of the Mississippian and Pennsylvanian of the country. Totaling 1066 pages, these volumes present an exhaustive state-of-the-art overview of the German Carboniferous, based on thorough reviews of innumerable, widely dispersed papers as well as new research and interpretations.


(available from Schweizerbart Verlag, Stuttgart).


(available from Deutsche Gesellschaft für Geowissenschaften, Hannover).

The Mississippian volume contains 39 papers by 40 authors. The introductory part includes a short account of the history of stratigraphic research by D. Stoppel and M.R.W. Amler, followed by an outline of the current state of the boundaries and subdivision of the Mississippian of Germany by Stoppel and coauthors. D. Weyer and M. Menning discuss isotopic age determinations and relations to northwest European and global Carboniferous stages, respectively, as well as relationships between both stratigraphic scales. H.-J. Gursky provides an integrated overview of the paleogeographic, paleoceanographic, and facies evolution of the German Mississippian.

Ten, mostly very well illustrated papers discuss the spatial and stratigraphic distribution of the macrofauna, often including information on facies dependencies: corals (D. Weyer), brachiopods (C.F. Winkler Prins and M.R.W. Amler), bryozoans (H.M. Weber and P.N. Wyse Jackson), gastropods and bellerophonitids, bivalves and rostroconchs (both M.R.W. Amler), ammonoids (D. Korn), trilobites (C. Brauckmann and G. Hahn), ostracodes (H. Blumenstengel), and echinodermes (E. Thomas and R. Haude). C. Brauckmann and coauthors discuss “rare fossils” (polyplacophorids, hyolithids, non-trilobite arthropods, including insects). Of special importance is a bivalve biostratigraphy of the Kulm Basin, a review of the known trilobite biostratigraphy in different shallow-water and basinal facies realms, and an extremely detailed ammonoid biostratigraphy.

Four papers present the microfauna. H.-G. Herbig and D. Stoppel review the conodonts, including discussions of the international D–C boundary, T–V boundary, mid-Carboniferous boundary, conodont biofacies, CAI data, and geochemical data. A. Braun elucidates the preservation modes and biostratigraphy of radiolarians. H.-G. Herbig summarizes the previously widely dispersed knowledge on arenaceous and smaller calcareous foraminifers. Another paper on calcareous algae and incertae sedis is found in the paleobotany chapter. (With minor exceptions, these three groups were not yet systematically studied in Germany.)

In the paleobotany chapter, H. Kerp and coauthors give a complete overview of the rare, long neglected megafossils. Palynostratigraphy and correlations with Poland and the British Isles are treated by H. Jäger and F. Wierich; H. Jäger also discusses in greater detail the palynostratigraphy and sedimentary development of the island of Rügen, northeastern Germany.

About half of the volume is dedicated to the regional development of the Mississippian in Germany. The three major chapters, partly with colored illustrations, correlate with the structural zones of the German Variscides.

The first chapter treats the deeper water facies (“Kulm facies”) of the Rhenohercynian Zone. Two quite extensive and nicely illustrated contributions by Stoppel and coauthors and of Bender and Stoppel, respectively, describe the Mississippian of the Rheinische Schiefergebirge. In a third contribution, D. Korn proposes a new lithostratigraphic scheme for that region by substituting for the traditional lithostratigraphic terms lithostratigraphic groups and formations defined according to the International Stratigraphic Guide. D. Stoppel presents the isolated, but paleogeographically important occurrences of Mississippian rocks in southwestern Germany (Saarland, Rhineland-Palatine), Mississippian stratigraphy and facies of the western Harz Mountains are detailed by Buchholz and coauthors, who also include radiometric ages as well as paleomagnetic data and reconstructed paleopole positions. Although their contribution contains some data concerning the eastern Harz Mountains, that region is only discussed in a short contribution by Stoppel. Paech and coauthors describe the northeastern prolongation of the Mississippian of the Harz Mountain into the subsurface and the northernmost outcrops of the central European Carboniferous in the Flechtingen-Rosslau block between Dessau and Magdeburg. D. Franke gives an overview of the deep exploration wells in the Altmark-Nordbrandenburg Kulm of northeastern Germany. Although not well known to the scientific community, they are
of major paleogeographic importance for the extension of the Rhenohercynian Kulm facies.

The second chapter reviews the Mississippian carbonate platform facies which developed on the external side of the Kulm Basin in northeastern Europe. M.R.W. Amler and H.-G. Herbig discuss stratigraphy and facies of the easternmost platform sediments which rim the London-Brabant massif in easternmost Belgium, westernmost Germany (Aachen region), and in the subsurface of the Niederrhein embayment. They also elucidate the transition into the Kulm Basin in the westernmost Rheinische Schiefergebirge and propose a new lithostratigraphic scheme which as far as possible adapts the Belgian formations. The second well known region in Germany which displays predominantly carbonate platform facies is known from deep wells in western Pomerania, mainly from Rügen Island, at the southwestern margin of the eastern European platform (N. Hoffmann and coauthors). Additional interesting boreholes in northern and northwestern Germany are briefly reviewed by Stoppel.

The third chapter deals with the Kulm facies in the more internal zones of the Variscides (i.e., in the Saxothuringian and Moldanubian Zones). J. Gandl outlines the complex development of the Mississippian in northeastern Bavaria (Frankenwald). That paper is supplemented by that of H. Blumenstengel, who describes the development in adjoining areas of eastern Thuringia. Knowledge of the isolated occurrences of Mississippian rocks in Saxony and southern Brandenburg, including well data, is compiled by A. Kampe; this paper also includes a new geological map of the Görlitzer Schiefergebirge. In a second contribution, A. Kampe and coauthors describe the isolated Upper Viséan to Lower Namurian (Arnsbergian) intramontane molasse sediments from Saxony and southern Brandenburg which is the earliest sedimentary record of the uplifted Variscan orogen in Germany. The stratigraphic and structural development of the Carboniferous of the Black Forest-Vosges region, lateral correlations within the Variscides, and a geodynamic interpretation is elucidated by R. Maass.

In a separate chapter, H.-D. Nesbor treats the Mississippian volcanism in the eastern Rheinisches Schiefergebirge which is composed of basaltic submarine pillow lava and dacitic to rhyodacitic ashflows which originating outside of the basin. Finally, F. Wierich discusses geodynamic models of the northern Variscides which are based on the existence of the Mid German Crystalline rise. According to the postulated Carboniferous exhumation of that unit, it is interpreted as a Variscan nappe.

The *Pennsylvania volume* contains 27 papers by 44 authors. In the introduction, the process leading to definition of the Mid-Carboniferous boundary and its position and applicability in Germany are discussed by H.-G. Herbig. A second contribution by Krull elucidates the paleogeographic framework of the German Pennsylvania, outlining the development of the Northern European paralic foredeep between the British Isles and Poland, and of intramontane basins.

The paleontological chapters begin with a discussion of the low diversity ammonoid faunas by J. Kullmann. A short review of marine bivalves, gastropods, and bellerophontids by M.R.W. Amler is perfectly complemented by a very well illustrated contribution to the stratigraphy, ecological variability, and paleogeographic relations of the non-marine and limnic bivalves by R.C.M. Eagar. H.-G. Herbig reports on the taxonomy, stratigraphic distribution, and paleoecological constraints of paralic microfaunas (foraminifers, ostracodes, conodonts, and other less studied groups). The revised conodont zonation, which is based on valid taxa, is particularly important. In a well figured contribution, C. Brauckmann reviews the rare, but diverse arthropods and their paleoecology (insects, arachnids, xiphosurids, eurypterids, “myriapods”, arthroleurids, trilobites). A discussion of the non-marine and limnic faunas of the intramontane basins and the Variscan foredeep strata; among others, fishes, conchostracans, and insects (blattoids), and their biostratigraphic significance; a new combined conchostracan-blattoid biostratigraphy is established for the Westphalian and Stephanian by J. Schneider and coauthors. K.-H. Josten reviews the detailed macroplant stratigraphy, based on some 250 species from 46 genera. Finally, Ch. Hartkopf-Fröder contributes to the history of palynological research in the Pennsylvanian, reviewing the palynostratigraphic zonation of paralic and intramontane basins, and commenting on the paleoecological constraints of the microfloras.

An important chapter is “Zeitmarken” (time marks). It includes three papers dealing with cyclothems, cycles, and sequences in the Ruhr Basin and their interdependent controlling factors (by M.P. Süß), the stratigraphic importance of kaolin coal tonsteins (by K. Burger and coauthors), and the refinement and discussion of a numerical time scale for the central European Pennsylvanian (by M. Menning and coauthors).

More than half of the volume concerns the regional development of the German Pennsylvanian and focuses on the lithostratigraphy, biostratigraphy, stratigraphic correlations, and facies in both outcrop and subsurface. In many cases, lithostratigraphic formations have been newly defined or redefined, respectively.

Seven contributions concern the paralic realm of the Subvariscan zone. V. Wrede and M. Zeller deal with the region between the Rhine River in the east and the Dutch South Limburg Basin in the west. Of particular importance is a correlation of coal seams between the latter and the Ruhr area. The 5000–7000 m thick, intensively mined succession of the Ruhr Basin is reviewed by V. Wrede; K.-H. Ribbert contributed to that paper and suggests a new lithostratigraphic scheme for the less well known Namurian below the coal-bearing strata. Surface and subsurface stratigraphy of the Osnabrück district is reviewed by K. Köwing and R. Rabitz. In a longer, well illustrated contribution, G. Drozdzewski comments on the interplay of eustacy, subsidence, and sedimentary development, as well as basin evolution and paleogeographic relations of the Northwest German Subvariscan Basin. H.-J. Paech describes the Pennsylvanian of the Flechtingen Block west of Magdeburg. In two contributions, Hoth and coauthors present the Pennsylvanian known from deep wells in the subsurface of northeastern Germany. Except for the island of Rügen and adjacent Vorpommern, this is the first comprehensive review
of the region.

The late Pennsylvanian of the German intramontane basins is described in seven further contributions. A. Schäfer gives a detailed review of the stratigraphy of the Permo-Carboniferous Saar-Nahe Basin including discussions of chronostratigraphic attributions and the Stephanian–Rotliegend boundary. R. Maas and D. Vogellehner present the Pennsylvanian of the Black Forest, and D. Andreas and coauthors discuss the structurally complex region of the Thuringian Forest. In two contributions, Schneider and coauthors deal with the NE-striking, about 150-km long by 90-km wide Saale Senke of Saxony-Anhalt, and several smaller basins in Saxony, which are relics of a greater drainage system. These papers are supplemented by two shorter contributions describing the Westphalian known from wells between Leipzig and Wittenberg (V. Steinbach and A. Kampe) and north of Görlitz (H. Brause), eastern Germany (Saxony, Saxony-Anhalt).
Dr U.G. Cordani
Instituto de Geociências
Universidade de São Paulo
CP 11348 CEP 05422-970
São Paulo
BRAZIL

Dr Jose Henrique G. Melo
Petrobras/CNPq/PDEXP/BPA
1112 Cicade Universitaria
Quadra 7, lha 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 Geociências
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 Geociências
Universidade Federal do Rio
Grande do Sul
Av. Bento Gonçalves, 9500
91.540-000 - Porto Alegre - RS
BRAZIL
Email: 1363669@vortex.ufrgs.br

**CANADA**

Dr Wayne Bambar
Geol.Surv.Canada, Calgary
3303-33rd St. N.W.
Calgary AB, T2L 2A7
CANADA
Fax: 403-292-6014
Email: bambar@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

**BULGARIA**

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

**BULGARIA**

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

**CZECH REPUBLIC**

RNDr Stanislav Oplustil
Charles University
Institute of Geology & Palaeontology
Dept Genetics & Microbiology
搌ědrow@sparc.uccb.ns.ca

Dr Jiri Kráš
Dept Genetics & Microbiology
Fac. Science, Charles University
Viniceň 5
128 44 Praha 2
CZECH REPUBLIC

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
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 Jiri Kalvoda
Department of Geology and Paleontology
Masaryk University
Kotlářská 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. Nemirovska
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