

The **Task Group to establish the Bashkirian-Moscovian boundary**, chaired by John Groves, reports the following: In 2008 members of the Task Group to establish a GSSP close to the existing Bashkirian-Moscovian boundary 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 Syncline, Spain, northern Europe, Japan, Arctic Canada, 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 traditionally accepted base of the Moscovian Stage. Therefore, the proposal merits and will receive further evaluation.

Specialists with the Nanjing Institute of Geology and Palaeontology organized an excursion in May, 2008 to Guizhou Province in south China to collect additional conodont, foraminiferal, and sedimentology samples from the Bashkirian-Moscovian boundary interval at the Nashui section, where slope carbonates of turbidite or 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 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 integrated 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.

Elena Kulagina examined the evolutionary lineage leading to the origin of the fusulinid *Depratina prisca* (= *Profusulinella prisca* of other authors) in the Bashkirian-Moscovian boundary interval of the southern Urals. She demonstrated that the known stratigraphic and geographic occurrences of *D. prisca* form an empirical basis for using its appearance to recognize—or even define—the base of the Moscovian Stage, a conclusion that is consistent with Altiner's work in Turkey.

Depratina prisca has not been recognized in cratonic North America, a circumstance that seemingly mitigates against its utility as a worldwide lower Moscovian marker. Kulagina noted, however, that certain North American profusulinellids of approximately the same age (e.g., *P. marblensis*) might be assignable to *D. prisca*.

Our Task Group has evaluated three proposals for defining the base of the Moscovian Stage: 1) appearance of an advanced morphotype of *Neognathodus nataliae*; 2) appearance of *Idiognathoides postsulcatus* from *I. sulcatus*; and 3) appearance of *Declinognathodus donetzianus* from *D. marginodosus*. The first of these proposals received little support from Task Group members, whereas the second and third received conditional support.

Both *D. donetzianus* and *I. postsulcatus* appear in the K₂ limestone in the Donets Basin in close association with the appearances of the fusulinids *Eofusulina triangularis* and *Aljutovella aljutovica*. The appearance of *D. donetzianus* also closely coincides with that of *A. aljutovica* in the upper Alyutovo Formation in the Moscow Basin. It is reasonable to expect that the K₂ level (or an equivalent level elsewhere) may emerge as the basal Moscovian datum.

Given that either *D. donetzianus* or *I. postsulcatus* might be chosen as the marker and that both have limited geographic distributions, our challenge is to demonstrate how the base of the Moscovian Stage might be identified in areas where these taxa do not occur. Members of the Task Group were asked in 2006 to address this challenge. To date, responses have been received from specialists working in the South Urals, Spain, Turkey, China, northern South America, and cratonic North America.

A positive observation to emerge from our work is that fusulinids of the *Profusulinella prisca* group appear at or near the base of the Moscovian Stage in many regions, including the South Urals, Spain, and Turkey. North American and South American specimens identified as *P. decora* and *P. marblensis* may be referable to *P. ex gr. prisca*, and thus represent a means for even broader geographic recognition of the basal Moscovian.

Other highlights:

- A team of Spanish researchers led by Elisa Villa is carrying out detailed multidisciplinary biostratigraphic studies of the Bashkirian–Moscovian boundary interval at the Las Llacierias section (Cantabrian Mountains).
- Russian specialists Elena Kulagina and Vladimir Pazukhin have discovered that *D. donetzianus* occurs in evolutionary continuity with its ancestor *D. marginodosus* at the Basu section in the South Urals. This transition is associated with a rich fusulinid fauna.
- Demir Altiner and his students have documented a sequence of fusulinids spanning the Bashkirian–Moscovian boundary in the central Taurides of southern Turkey. They provisionally recognize the boundary on the appearance of *P. prisca*. This event occurs about 2–3 m below the lowest *A. aljutovica* and *Eofusulina* sp.
- Wang Xiangdong, Wang Zhihao, and Katsumi Ueno are undertaking multidisciplinary studies at the Nashui Section near the city of Luodian, South Guizhou, China. They report the appearance of *Diplognathodus ellesmerensis*

at approximately the same level as the appearance of *D. donetzianus*.
Diplognathodus ellesmerensis is known from the Bashkirian-Moscovian boundary interval in Arctic Canada, Donets Basin, Moscow Syncline, Spain, Japan, Western Europe, and possibly cratonic North America, and thus may represent a possible boundary defining taxon for further evaluation.

References

- Qi, Y., Wang, Z., Wang Y., Ueno, K. and Wang, X. 2007. Stop 1: Nashui section. 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 p. 8 – 16.