МИНИСТЕРСТВО ПРИРОДНЫХ РЕСУРСОВ
РОССИЙСКОЙ ФЕДЕРАЦИИ

СИБИРСКИЙ НАУЧНО-ИССЛЕДОВАТЕЛЬСКИЙ ИНСТИТУТ
ГЕОЛОГИИ, ГЕОФИЗИКИ И МИНЕРАЛЬНОГО СЫРЬЯ
(СНИИГГиМС)

ПАЛЕОНТОЛОГИЧЕСКИЙ ИНСТИТУТ РОССИЙСКОЙ АКАДЕМИИ НАУК

THE 13TH INTERNATIONAL FIELD CONFERENCE OF THE CAMBRIAN STAGE SUBDIVISION WORKING GROUP

The Siberian Platform, Western Yakutia

YAKUTSK,
July 20th –August 1nd
2008

XIII МЕЖДУНАРОДНАЯ ПОЛЕВАЯ КОНФЕРЕНЦИЯ РАБОЧЕЙ ГРУППЫ ПО ЯРУСНОМУ РАСЧЛЕНЕНИЮ КЕМБРИЯ

Сибирская платформа, Западная Якутия

ЯКУТСК
20 июля – 1 августа 2008 г.

Новосибирск
2008

УДК 551.732.2/.732.3+56:551.732.2/.732.3(06)(571.5+571.56-15+100)

THE 13TH INTERNATIONAL FIELD CONFERENCE OF THE CAMBRIAN STAGE SUBDIVISION WORKING GROUP. The Siberian Platform, Western Yakutia = XIII МЕЖДУНАРОДНАЯ ПОЛЕВАЯ КОНФЕРЕНЦИЯ РАБОЧЕЙ ГРУППЫ ПО ЯРУСНОМУ РАСЧЛЕНЕНИЮ КЕМБРИЯ. Сибирская платформа, Западная Якутия [Текст]. – Новосибирск : СНИИГГиМС, 2008. – 98 с.

Сборник содержит тезисы докладов и короткие статьи, посвященные стратиграфии, палеонтологии, геохимии и некоторым аспектам палеогеографии и тектоники Сибири, Казахстана, Китая, Ближнего и Среднего Востока, Северо-Восточной Африки, Испании и Северной Америки. Подведены итоги деятельности международной подкомиссии по кембрийской стратиграфии и ее рабочих групп по расчленению и границам нижнего и среднего кембрия в традиционном понимании. Приведены материалы разрезов кембрийских отложений, предлагаемых в качестве потенциальных стратотиплов ярусных подразделений и их нижних границ Международной стратиграфической шкалы.

The Conference proceedings include abstracts and short papers covering numerous topics of Cambrian stratigraphy, palaeontology, as well as some aspects of palaeogeography, tectonics and geochemistry of Siberia, Central and Southeastern Asia, Europe, the Middle East and Northern America. Results of activity of the ISSC and its working groups are summarized in this volume. Detailed geological information on sections proposed as potential stratotypes for the Global Stages and their lower boundaries is also presented.

Фотография на обложке О. Б. Олейникова

UNSOLVED PROBLEMS OF THE CAMBRIAN SUBDIVISION

A. Yu. Zhuravlev

Área y Museo de Paleontología, Facultad de Ciencias, Universidad de Zaragoza (Zaragoza, Spain)

A few steps separate us from the final decision on a Cambrian System series and stage subdivision. However, these steps are the most tough as the remaining part of the system, which are the series 1 and 2 or the former Lower Cambrian, comprises over two thirds of its entire length. Moreover, this is the units that almost lack any fossil species suitable for an intercontinental correlation while genera are either endemic or too longevous to be firm enough indices. On the other hand, after the first years of exaltations, it is clear now that neither isotope stratigraphy nor other non-biostratigraphic methods are able to help in a solution of these problems without a precise biostratigraphy itself.

All these problems do not mean, by no means, that Cambrian sections are either defective or badly studied (e.g., Geyer, 2001). On the contrary, the Cambrian sections of Australia, China, North America, Siberia, Spain and other regions, where potential or already established Global Stratotype Section and Boundary points (GSSP) of Cambrian series and stages are selected, are among the best sections in the whole Phanerozoic in respects of both their completeness and their characteristics by diverse stratigraphic methods.

The problem is that our understanding of biological and ecological process ruled Cambrian faunal and floral patterns that finally are reflected in the palaeontological record is still in its infancy. However, such processes distinguish the Cambrian Period, especially its early epochs, from other Phanerozoic periods in a manner as those governed the Cryptozoic life.

The most typical and bright example of such peculiar process is expressed in the biogegraphic regularities of early Cambrian epochs. Palmer (1998) noted that there were strong biogeogaphic differences within the Cambrian world. However, such differences were typical of the most of the Phanerozoic but were not so influential in biostratigraphy of other systems. The real problem is that if modern marine biogeography is primarily the function of climatic differentiation expressed in an existence of more or less symmetrical realms in both northern and southern hemispheres, such a pattern is hardly observed until ultimate Cambrian epochs.

A pilot study of archaeocyath species diversity regularities reviled that two major factors, namely, beta- and gamma-diversities, governed their diversification (Zhuravlev, Naimark, 2005). The first of them reflects diversification between communities (microfacies), the second one is indicative of biogeographic differentiation (number of provinces). In turn, these provinces were limited by tectonic factors rather than by climatic ones (Debrenne et al., 1999; Palaeogeographic..., 2000). The most striking aspect of these studies was that the beta-diversity was the principal factor of biodiversification, which brought out an extremely high endemicity of early Cambrian faunas. This is reflected in existence of numerous concurrent zonations established even within relatively small regions. On contrary, a presence of similar microfacies in remote regions led to an appearance of absolutely similar communities where even a quantitative share of each species was the same. Probably, the same is true for other early Cambrian faunas, e.g., trilobites (Palaeogeographic..., 2003) and acritarchs. The pattern of biogeographic distribution of the latter is extremely different from that of younger planktic algae which may explain inconsistencies existing in correlations based on acritarch «global» zonation and on other zonations (Palmer, 1998; Moczydłowska and Zang, 2006).

Contrary to Palmer's (1998) suggestion, turnover of early Cambrian taxa was more rapid than that of later Cambrian ones, which were characterized by an increased longevity (Zhuravlev, 2001). As a result the endemicity again increased.

Thus, the only possibility to obtain reliable lower Cambrian GSSPs is a selection of such sections, which are characterized by the most diverse fossils representing different taxonomic groups, and are suitable for an application of other stratigraphic methods.

REFERENCES

Palaeogeographical controls on the Cambrian trilobite immigration and evolutionary patterns reported in the western Gondwana margin [Text] / J. J. Álvaro, O. Elicki, G. Geyer [et al.] // Palaeogeography, Palaeoclimatology, Palaeoecology. – 2003.. – Vol. 195. – P. 5–35.

Palaeobigeographic affinities of Australian Cambrian faunas [Text] / G. A. Brock, M. J. Engelbretsen, J. B. Jago // Memoir of the Association of Australasian Palaeontologists. – 2000. – N 23. – P. 1–61.

Debrenne, F. Faunal migrations of archaeocyaths and Early Cambrian plate dynamics [Text] / F. Debrenne, I. D. Maidanskaya, A. Yu. Zhuravlev // Bulletin de la Société géologique de France. – 1999. – N 170. – P. 189–194.

Geyer, G. Correlation in the Cambrian: Puzzling facts or wrong concepts? [Text] / G. Geyer // Palaeoworld. – 2001. – N 13. – P. 87–98.

Moczydłowska, M. The Early Cambrian acritarch *Skiagia* and its significance for global correlation [Text] / M. Moczydłowska, W.-L. Zang // Palaeoworld. – 2006. – N 15, – P. 328–347.

Palmer, A. R. Why is intercontinental correlation within the Lower Cambrian so difficult? [Text] / A. R. Palmer // Revista Española de Paleontología. – 1998. – Número extraordinario (homenaje al Prof. Gonzalo Vidal). – P. 17–21.

Zhuravlev, A. Yu. Biota diversity and structure during the Neoproterozoic-Ordovician transition [Text] / A. Yu. Zhuravlev // The ecology of the Cambrian radiation. – New York : Columbia University Press, 2001. – P. 173–199.

Zhuravlev, A. Yu. Zhuravlev, A.Yu. and Alpha, beta, or gamma: Numerical view on the Early Cambrian world [Text] / A. Yu. Zhuravlev, E. B. Naimark // Palaeogeography, Palaeoclimatology, Palaeoecology. – 2005. – N 220. – P. 207–225.