Report on International Workshop on Geodynamic Evolution, Tectonics and Magmatism of the Central Asian Orogenic Belt and pre-Workshop field excursion to Gorny Altay, Russia

held on June 20-30, 2010 in Novosibirsk, Russia (http://altay2010.igm.nsc.ru)

This Workshop and pre-workshop field trip were organized by the Institute of Geology and Mineralogy, Siberian Branch, Russian Academy of Sciences (SB RAS) and co-sponsored by the Presidium of the Siberian Branch of the Russian Academy of Science (SB RAS), Centre for Russian and Central EurAsian Mineral Studies (CERCAMS), and Task Force 1 (ERAS) of the International Lithosphere Program (ILP). This is preceded by a field excursion to Gorny Altay in Southwestern Siberia (June 20-28, 2010), which, in the literature, is also referred to as Mountainous Altay or Russian Altay. The field excursion and the Workshop attracted eighteen participants from 8 countries, namely Germany, England, Japan, China, France, Czech Republic, Poland and Russia.

The main goal of this Workshop is to discuss the general evolution of the Central Asian Orogenic Belt (CAOB) with a special emphasis to the problems of continental growth, evolution of palaeo-oceans and active continental margins, collisional tectonics and metallogeny based on results of previous field missions and analytical research. We would like to contribute to our understanding of the Late Neoproterozoic to Paleozoic evolution of the Altay belt and to establish up-to-date models of ocean closure, continental accretion/assembly and intracontinental orogeny.

An important experience in joint study of the CAOB was IGCP Project 283 “Geodynamic evolution of the Paleo-Asian Ocean” and its related 1993 international field excursion to Gorny Altay. The Project started with the meeting in Urumqi, 1989, which was organized by the Chinese Academy of Sciences. Project symposia took place in Ulan-Ude (1991, Russia), Shenyang (1992, China), and Kyoto (1992, Japan). The participants were scientists from China, Japan, Kazakhstan, Kyrgyzstan, Mongolia, Russia, Turkey, USA and UK. The Project resulted in creation of a Geodynamic map of the CAOB including Tien Shan, East Kazakhstan, southern Siberia, Mongolia, northern China. Tat for the first experience of making such a map, covering a huge territory and considering systematically selected geological and geodynamic units of the folded frame of the Siberian Craton. The leaders and coordinators of the Project were L. Zonenshain, R.Coleman, T.Watanabe, X. Xuchang, E. Chang, O. Tomurtogoo, N. Dobretsov and N. Berzin.

The Altay2010 field excursion includes en-route and camp-based field observations of the major geological structure of the Gorny Altai - Middle Palaeozoic suture-shear zone, which separates the Siberian and Kazakhstan-Baikal continents (fig.1). The Participants will have an opportunity to study - 1) the Charysh-Terekta-Ulagan-Sayan suture-shear zone comprises fragments of the Late Cambrian-Early Ordovician ophiolites (oceanic crust) of the Ob’-Zaysan oceanic basin and Ordovician-Silurian blueschists, turbidites and crystalline schists; 2) the units of the Late Neoproterozoic-Cambrian island-arc, accretionary and active margin, Ordovician-Silurian passive margin and Devonian active margin of the Siberian continent; 3) the Gondwana-derived Altay-Mongolian terrane - a part of the composite Kazakhstan-Baikal continent; and 4) the Late Paleozoic syn- and post-collisional magmatic and metamorphic rocks, strike-slip and thrust fault structures.

During the International Workshop and pre-Workshop Excursion the participants are discussed to problems of tectonics and geodynamics of Russian Altay and adjacent territories of East Kazakhstan, North China and West Mongolia. This is of special interest because recently obtained data on those territories would allow us to re-consider the available tectonic models for the formation of the Altay orogen belt in particular and the CAOB in general. The results of future discussions may serve a basis for future international research projects on global geodynamics, prospecting mineral resources and tectonic reconstructions.

The participants made 29 oral and 9 poster presentations during the workshop within four scientific sessions: 1) Geodynamic evolution of the Central Asian Orogenic Belt and problems of continental growth: role of mantle plumes, Gondwana blocks and subduction-accretion belts(conveners: *N. Dobretsov, W. Xiao*); 2) Evolution of palaeo-oceans and active continental margins: sedimentary, oceanic, accretionary and island-arc complexes (conveners: *S. Kojima, I. Safonova*); 3) Collisional tectonics and geodynamics: orogenic and post-orogenic magmatism, suture-shear zones, strike-slip faulting(conveners: *A. Kröner, M. Buslov*); 4) Geodynamics and metallogeny(convener: *R. Seltmann*) . The concluding discussions were very engaged and touched such vital problems as too much speculation in the interpretation of analytical data, the necessity of field evidence for many currently available models, quality of data, time and extent of mantle plumes and their geological, geophysical and geochemical evidences, etc. An important recommendation was to launch a new IGCP project with the tentative title "Continental construction of the CAOB compared to actualistic examples from the SW Pacific (Japan to Indonesia)". Letters of support with expressions of interest to contribute can be sent to Dr. Inna Safonova inna03-64@mail.ru.

Inna Safonova, Senior Research Scientist at the Laboratory of Geodynamics and Magmatism of the Institute of Geology and Mineralogy SB RAS, Novosibirsk. Inna graduated with MSc (Hons.) degree in Geochemistry from Novosibirsk State University in 1987, and with MSc (Hons.) degree in Business Administration from the Russian Business Academy in 2004. She obtained her PhD degree in Geotectonics, Geodynamics, Petrology and Volcanology from the United Institute of Geology, Geophysics and Mineralogy, SB RAS, Novosibirsk, in 2005. She participated in, and initiated, many field missions in Russia, Kazakhstan, Kyrgyzstan and Japan (1995-2010). She joined the team of Associate Editors of *Gondwana Research* in May 2010. Her research fields include continental growth; magmatism and stratigraphy of paleo-oceans; igneous geochemistry and petrology; timing, extent and sources of plume magmatism in Central Asia.

Mikhail Buslov, Chief of Laboratory of Geodynamics and Magmatism at the Institute of Geology and Mineralogy, Siberian Branch, Russian Academy of Sciences (SB RAS). Mikhail graduated with an MSc degree in Geology (1978) from Novosibirsk State University, obtained his PhD in Geotectonics (1988) from the Institute of Geology and Geophysics, SB AS USSR (Novosibirsk), and the DSc degree in Geodynamics and Geotectonics (1999) from the United Institute of Geology, Geophysics and Mineralogy SB RAS, Novosibirsk. During more than 25 years he undertook extensive fieldwork in many regions of Russia (Altay, Tuva, East and West Sayan, Far East, Transbaikalia, etc.), Mongolia, Kazakhstan, Kyrgyzstan, Tajikistan and many other countries. His research field includes geodynamics, structural geology, active tectonics, metamorphic and igneous petrology, and geochronology; geological mapping of regional fault zones, accretionary complexes, collisional belts in Central Asia.

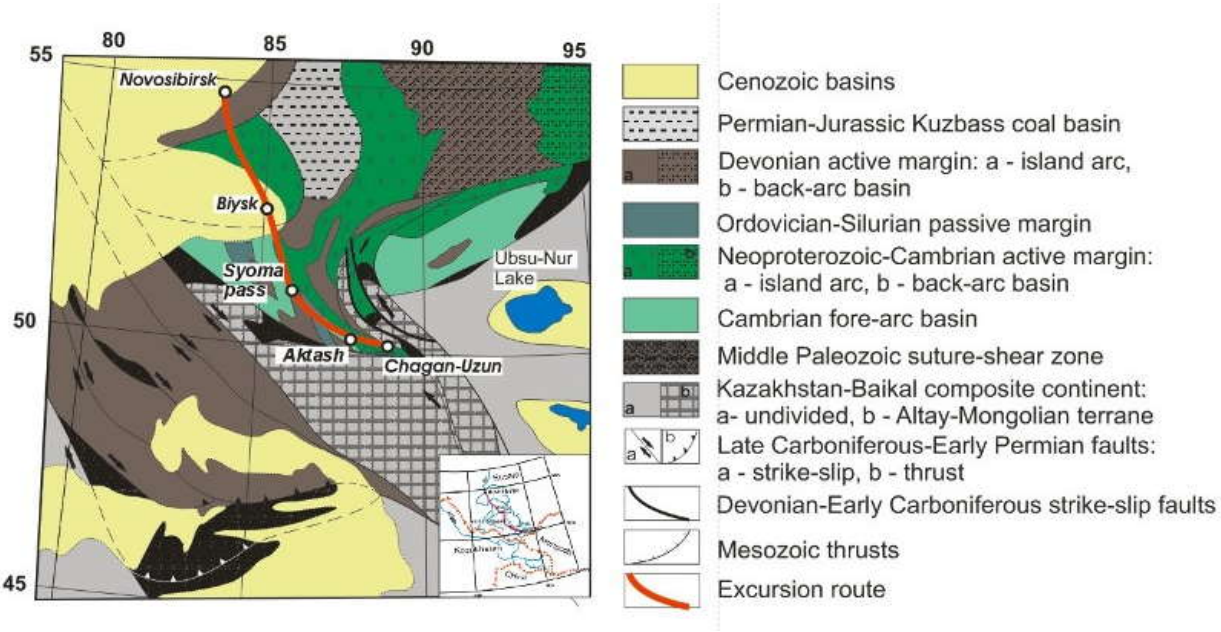

Fig. 1. Main geodynamic units of Altay and adjacent regions and route for pre-workshop field excursion to Gorny (Russian) Altay

Photos from the field trip and workshop

The Katun accretionary complex: paleoseamount pillow lavas and carbonate cap

View to the North Chuya Range with outcrops of the Kurai accretionary complex in the foregrounds

Studying the first outcrop – Devonian active margin (left to right, 1st row): Alfred Kröner (Mainz), Keda Cai (Hong Kong), Vladimir Prelov (Moscow), Mikhail Buslov (Novosibirsk), Georgiy Biske (St. Petersburg)

The Kurai accretionary complex: discussing origin of greenstones and other units of OPS (left to right): Inna Safonova (Novosibirsk), Jeremie Lehmann and Alexandra Guy (Strasburg), Reimar Seltmann (London)

The Chagan-Uzun ophiolite massive (left to right): Dmitry Gladkochub (Irkutsk), Andrei Prokopiev (Yakutsk) and Alfred Kröner (Mainz)

Friendly sunny morning in Altay

A catastrophic landslide from the 7.3 M Altai 2003 earthquake

Warves of several metres thick Cenozoic glacial sediments

Opening ceremony of the conference:
Alfred Kröner (Mainz; left) and Reimar Seltmann (London)

Discussing problems of tectonic erosion:
Shigenori Maruyama (Tokyo)

Nikolai Dobretsov (Novosibirsk): mantle plumes are everywhere, why you do not want to see them!

Min Sun (Hongkong): studying the booklet of the IGM SB RAS and thinking over prospects for future cooperation

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