IAGOD

NEWSLETTER

2003

THE INTERNATIONAL ASSOCIATION
ON THE GENESIS OF ORE DEPOSITS
International Association on the Genesis of Ore Deposits (IAGOD)

IAGOD is an international association of both individual and national members. The object of the IAGOD is to promote international cooperation in the study of the genesis of ore deposits and to further the growth of knowledge in this field. The IAGOD was established during the IGC in New Delhi, India, 1964. The Association continues to expand its international activities and membership.

IAGOD membership privileges include:

- Participation in an international association focussing on ore deposit studies.
- Preference on IAGOD symposia, workshops and meetings.
- Annual IAGOD Newsletter.
- Work in the IAGOD commissions and working groups.
- Reduced registration fees at IAGOD symposia.

Membership of the Association is open to applicants interested in genetic problems of ores if (1) he or she has graduated in earth sciences, chemistry or physics at a University, Technical University, or Mining Academy, (2) if he or she has at least three years of post-graduate experience in earth sciences, (3) if membership is recommended by two individual members of IAGOD, and (4) if he or she has published valuable results important for the study of the genesis of ore deposits. Applicants who are members of SEG or SGA need not submit a Sponsorship Form. The annual membership dues for individual IAGOD members are US $ 10 plus bank charges.

Inquiries concerning membership (including national groups and corporate membership) should be addressed to: Dr. R. Seltmann, IAGOD Membership Secretary, Natural History Museum, Dept. Mineralogy, Cromwell Road, London SW7 5BD, UK, Phone: +44 207 942 5042, Fax: +44 207 942 5537, e-mail: rs@nhm.ac.uk

New IAGOD website:

http://www.geology.cz/host/iagod.htm

The IAGOD Newsletter is an informative bulletin of IAGOD, is published by the IAGOD Secretary General at the Geological Survey of Norway annually and sent free to all IAGOD members. The IAGOD Newsletter contains the reports of the officers of IAGOD commissions and working groups. The IAGOD Newsletter is open to all IAGOD members. As well as the various columns in the newsletter in which IAGOD activities are reviewed, the newsletter can also contain previously unpublished results may be published here in the form of short abstracts (maximum 1 page of A4 format). All IAGOD members are also encouraged to send to contributions for the IAGOD Newsletter 2004 to the editor. The deadline for the next newsletter is 15th April 2004.

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793 26 Vrbno pod Pradedem, Czech Republic
Editorial

The 11th Quadrennial IAGOD Symposium and Geocongress in Windhoek, Namibia, 22nd-26th July 2002 is now behind us. Thanks to the tremendous efforts of the local organising committee and their host organisations (Geological Society of Namibia, Geological Survey of Namibia, Council for Geoscience and the Geological Society of South Africa), the meeting was a tremendous success and very much enjoyed by all who participated in the meeting and enjoyed the wonderful geology and landscapes of Namibia.

Although IAGOD is hosting no major meeting in 2003, there are two exiting field workshops co-sponsored by IAGOD (see announcements elsewhere in this newsletter). IAGOD will also be present at the 7th Biennial Meeting of the Society for Geology Applied to Ore Deposits Athens, Greece at the end of August.

2003 marks an important step for IAGOD since we have now adopted the prestigious journal 'Ore Geology Reviews' as the official scientific journal of the association. Further details, and a mission statement from the editorial team can be found elsewhere in this newsletter.

Many IAGOD members will no doubt have visited the new association website: http://www.geology.cz/host/iagod.htm, hosted at the Czech Geological Survey. This will serve as the central source of information on association activities. Please check that your links to our site are updated.

Last but not least, my sincere thanks to all the many individuals who have contributed items for this newsletter, and in good time. With best wishes for a pleasant and prosperous Summer.

Nigel Cook, Secretary General IAGOD
Trondheim, Norway, 27th June 2003

IAGOD Membership

1) National Members (12 countries):
China, Czech Republic, Kazakhstan, Kyrgyzstan, Mongolia, Russia, Slovakia, Spain, Tajikistan, Georgia, Uzbekistan, Ukraine.

2) Honorary Life Members: 9
(Ridge), Kautsky†, Stemprok, Tischendorf, Kutina, Foerster, Vaneczek, Sclar, A. Heyl, R. Boyle.

3) Corporate (Institutional) Members (11):
Anglo American plc UK (C. Carlon), Aur Resources (James Gill), Barrick (C. J. Hodgson), Billiton (Gordon Koll), Blackwell Publishing (Judy Cornish), Cominco (Cameron Allen), Cyprus Amas (David H. Watkins), Falconbridge (P.W.A. Severin), INCO (R. Horn), Ivanhoe Mines (Douglas Kirwin), Randgold (D. M. Bristow).

4) Individual Members (340)

NEW IAGOD MEMBERS

We welcome the numerous new members that have joined the association during the past 12 months. Unfortunately, our records are not fully complete at the time of going to press. Full details will be given in the next newsletter.
Gunnar Kautsky (27th January 1921 – 14th October 2002)

by Krister Sundblad, Turku University, Finland

The former President of IAGOD, Professor Gunnar Kautsky, Sweden, died on October 14, 2002 at the age of 81, following a long life in the service of geology within the international community.

Gunnar was born in Turku, Finland, on January 27, 1921, as the son of Fritz and Cecilia Kautsky. Although Fritz Kautsky was an Austrian, he was a well-recognized ore geologist in Scandinavia and held also a research position at Åbo Akademi University in Turku from 1920 to 1921. Fritz Kautsky and his family soon returned, however, to Austria where Gunnar grew up and took his first geology degree at the University of Vienna. The name Kautsky was also well known far beyond the geological communities in Europe at that time. Karl Kautsky, an uncle of Fritz, was also Austrian although born in Prague, and lived most of his life in Berlin and London. Karl Kautsky was a legendary socialist in the early part of the 20th century, but with such an independent profile relative to other Marxists that he was criticised and condemned by Lenin as the “renegade” Kautsky - something that would also influence Gunnar when travelling in Eastern Europe half a century later. For most people in Europe, and particularly those of Gunnar's generation, the early 1940's was a dangerous and terrible part of history. When Austria joined Germany in World War two, Gunnar was enrolled in the army but was severely injured in a traffic accident before arriving at the front. Gunnar almost died from this accident, but contradictory enough, Gunnar's life was probably saved due to this accident because he otherwise could have disappeared on the battlefields of Stalingrad, Kursk or Berlin. Gunnar's personality had thus formed with a colourful background, where ore geology and an international environment was part of the family tradition, but also under many extraordinary conditions in a turbulent period of the history of Europe. But with this background, I believe that Gunnar was particularly suited for surviving in a tough working climate and to become the foremost international ambassador of ore geologists and eventually president of IAGOD. We can distinguish at least five important profiles of Gunnar:

1) The survivor

Gunnar's fighting spirit and talent to tackle difficult situations were tested for the first time when he struggled to recover from his serious accident. Although he survived, his body remained badly damaged for the rest of his life. It is more than amazing that he was able to carry out fieldwork at all in mountainous regions in his future life, but Gunnar was an excellent field geologist for many decades. His survival instinct was tested at many other occasions, both in his professional and private life, not least when his wife Dora passed away in the 1970's and his second wife Stina followed in the 1990's. Only a real survivor can manage to find a new companion under such conditions, but Gunnar did find her, this time in Luxemburg.

2) The field geologist and scientist

After being confronted with fieldwork in the thrust nappe complexes in the Austrian Alps, Gunnar rapidly understood the importance of structural and stratigraphic relationships in orogenic mountain belts. When Gunnar came to Sweden in 1945, his Alpine experience was very valuable because the Boliden mining company wanted Gunnar to produce a stratigraphic and tectonic map for the Sulitelma-Salojaure region, just north of the Artic Circle, to enhance exploration for massive sulphide ores in the Swedish Caledonides. The Sulitelma-Salojaure region was one of the most unexplored and remote terrains of the Swedish-Norwegian mountain region and was mapped during five months in 1945-1947 by the then 24-26 year old Gunnar, who had only recently recovered
from his severe accident. Although Törnebohm had proposed nappe tectonics for the Scandinavian Caledonides as early as 1896, this had still not become generally accepted among Scandinavian scientists in the 1940's so the arrival of Gunnar to Sweden was a vitalizing factor for a process that paved the way for establishing a plate tectonic concept for the Caledonides in the 1970's.

Based on his investigations, he presented his first scientific publication in 1946 and defended his Licenciate thesis in 1947 and his PhD thesis in 1953, both in Stockholm. I developed a personal relationship with both the Sulitelma-Salojaure region and Gunnar's thesis on the area during the period 1980 to 1985, when Ebbe Zachrisson, Mike Stephens and myself, all then working for Gunnar at the Geological Survey of Sweden (SGU), remapped the region. Our working conditions were very different from those experienced by Gunnar forty years earlier; besides having more time to our disposal, we also had student assistants, access to air transport, aerial photographs, topographic maps and last but not least Gunnar's publications (and those of Oscar Kulling) on the area. Although we were in this way able to improve many details in the geological map (Sundblad, 1986), the basic principles of a thrust nappe complex in the area remained unchanged. This had been understood by Gunnar after only one summer in Sweden, something I am still deeply impressed about. Gunnar's understanding of geodynamic processes was also addressed in Precambrian ore-bearing regions, particularly the Skellefte district in northern Sweden (e.g. Kautsky, 1957), where his interpretations of the stratigraphy took into consideration the facies concept, which was something new in Swedish Precambrian geology.

3) The ore geologist

Gunnar was well acquainted with ore deposits and their geological nature from his father's investigations in Austria and Sweden. This, combined with his experience from regional mapping, made Gunnar realize the importance of combining prospecting for individual ore deposits with stratigraphic and tectonic interpretations. He was thus the natural choice for the Boliden company, when they wanted the geological framework for the Sulitelma-Salojaure region to be carried out in a modern way (see above). His scientific contributions on the geology of the Skellefte district were also important for a better understanding of the ore-forming environment in this important ore district. When Gunnar became head of the ore division at SGU, this experience was important when Gunnar guided new generations of geologists into the techniques and philosophy of exploration. Not restricting himself to the building up competence in geology and ore genesis, Gunnar also improved models for Quaternary geology in ore prospecting and initiated integrated geological, geophysical and geochemical prospecting programmes.

4) The organizer and international bridge builder

Gunnar had an unusual sense for scientific communication beyond national borders and language limits. In spite of not being Swedish, he became a central person at the Geological Survey of Sweden from 1953 to 1987, being the head of the ore division from 1959 to 1974, and later head of the bedrock section from 1974 to 1978. Gunnar's inspiring leadership at SGU and his sense for selecting and tying key persons (particularly Ebbe Zachrisson and David Gee) to his organization was also important for the ground-breaking scientific process of creating a plate tectonic understanding of the Caledonian orogeny and its associated ore deposits. In 1992, Gunnar received the title of Professor in recognition of his scientific contributions and creative leadership. He was also chairman of the Swedish National Committee for Geology and a very well appreciated member of the Nordic geoscience community. As such he was elected member of the Academy of Science of Finland in 1986 and the Royal Academy of Science of Norway in 1991. He was the natural leader for the inter-Nordic Nordkalott (1980-1986) and Mid-Norden (1989-1996) projects. In a wider global perspective, Gunnar was a member in the Commission for the Geological Map of the World (CGMW) and the International Geological Correlation Programme (IGCP). Gunnar was also Vice President in the International Union for Geological Sciences (IUGS). IAGOD became the perfect and ultimate platform for Gunnar, where all his skill in geological understanding and international communication was needed to bridge the political and cultural boundaries that hampered scientific communication between ore geologists in various parts of the world during the 1980's. Gunnar was Vice-president, President and Past-President of IAGOD and was the head of the organizing committee for the 7th Quadrennial IAGOD Symposium in Luleå, Sweden in 1986.
Gunnar was a natural 'man in the centre' in many ways, and on many occasions. In this picture from 1986, Gunnar is surrounded by Mike Stephens, Ebbe Zachrisson and Krister Sundblad. All had the privilege to work for Gunnar when his Ph.D. area was remapped and when the 7th Quadrennial IAGOD Symposium was organized in Sweden.

What is not seen from such a summary of formal positions was the active role Gunnar played in establishing real communication links with key persons in the geoscientific communities of the Soviet Union, Czechoslovakia, China and many other countries where the official representatives for each country were not always the most important. Many of these contacts had been established when Gunnar was the leader of a Swedish delegation visiting Moscow and the Caucasus in the 1960's. Gunnar's network of contacts in the east and west grew gradually during the following years at numerous conferences and meetings. While many of Gunnar's Soviet colleagues treated him with the highest respect due to his professional and personal qualities, the Soviet authorities were constantly suspicious of a person who carried the name Kautsky, and Gunnar had to use a Swedish diplomatic passport when travelling to Eastern Europe. When the international symposium “Gold 99 Trondheim” was organized in 1999, the now 78 year-old Gunnar participated in all activities, including the field tours. He was a living legend for the foreign participants, not the least the many Ukrainians that participated in the meeting.

5) The person

In spite of Gunnar's long formal list of merits, he will probably be remembered in particular for his strong personality, his engagement for geology and for his unconventional and unbureaucratic approach. All of us who had the privilege to work together with him saw him not only as the natural head of the group, but also as a close friend of an older generation, like a father. He had a warm and positive attitude to all members in the staff and was eager to provide optimal working conditions. Thanks to Gunnar, I was introduced to many pleasant persons and groups when I was still a young student; the Bor meeting in present-day Serbia in 1979 and the family of Tvalchredlidze in Tbilisi in 1987 are two very precious memories for me. It was always a real pleasure to share hotel rooms on field trips with Gunnar, because that was a guarantee for a long and entertaining evening with numerous interesting memories and viewpoints. The strong personality of Gunnar and his constant good mood, which continued also in recent years, made us often forget that he was, after all, not so young anymore. So when his life suddenly ended, we were all shocked and surprised at how this could happen to someone who had been so active until the last moment. Gunnar died in a taxi shortly after returning from a visit to the Azores, on his way back to the airport for a visit to Luxemburg. I believe that there are many of us who would prefer to pass away as Gunnar did - on his way from something good, and on his way to something even better.

Selected references


ORE GEOLOGY REVIEWS

The official journal of the International Association on the Genesis of Ore Deposits (IAGOD)

Beginning in April 2003, IAGOD has assumed editorial responsibility for this international journal, published by Elsevier.

The journal:

As the journal's subtitle says, the journal is devoted to comprehensive studies of ore genesis and ore exploration. The journal publishes peer-reviewed scientific articles that profile major ore deposits and districts from around the world. The articles range from comprehensive reviews to new data and interpretations. Since first published in 1986, more than 330 articles have been published in 23 volumes, including more than a dozen special issues dedicated to particular themes. Currently, the journal publishes 2 volumes annually, each volume consisting of 4 issues, both in printed and in on-line formats.

The new editorial team:

Editor-in-Chief and correspondence address:
Nigel J. Cook, Geological Survey of Norway,
N-7491 Trondheim, Norway

Members of the editorial board:
FÁbio Ramos Dias de Andrade (São Paulo, Brazil), Greg B. Arehart (Reno, USA), Frank P. Bierlein (Melbourne, Australia), Kamen Bogdanov (Sofia, Bulgaria), Cristiana L. Ciobanu (Trondheim, Norway, Cristiana.Ciobanu@ngu.no), Charles Cunningham (Reston, USA), Hans Albert Gilg (München, Germany), Jingwen Mao (Beijing, China), Stephen E. Kesler (Ann Arbor, USA), Khin Zaw (Hobart, Australia), Jaroslav Lexa (Bratislava, Slovak Republic), Eric Marcoux (Orléans, France), Roland K.W. Merkle (Pretoria, South Africa), Stephen M. Rowins (Vancouver, Canada), James A. Saunders (Auburn, USA), Reimar Seltmann (London, U.K.), Alexander Yakubchuk (Toronto, Canada), Yuanming Pan (Saskatoon, Canada).

The mission:

IAGOD do not intend to make changes to the overall coverage of Ore Geology Reviews (continuing publication of review articles, which are consistently among the most cited papers in the field of ore geology, as well as first-class descriptive papers on orefields of broad interest). However, we want to increase readership and make the journal still more relevant for IAGOD members and other potential
readers. We particularly welcome high-quality manuscripts on deposits in parts of the world little covered in the international literature, descriptions of newly discovered deposits, as well as papers that seek to provoke discussion upon controversial issues. We hope that the number of high-quality papers on areas in which there is a large IAGOD membership, particularly in Eastern Europe and the former USSR, will be increased.

The invitation:

Ore Geology Reviews is now the scientific journal of our association and therefore IAGOD invites all members to submit manuscripts for publication. With the active participation of our members, we aim to ensure the continued success of the journal, in which high-quality, authoritative papers are published that contribute to the understanding of the genesis of ore deposits at whatever scale. All enquiries concerning manuscripts should be addressed to the editor-in-chief. Guidelines for authors are available on the journal website http://www.elsevier.com/inca/publications/store/5/0/3/3/5/4/.

PAYMENT FORM

IAGOD Membership Fees

The annual dues are only $10 US per year. Please consider paying for four to five years at a time. That will save a considerable amount of money in bank fees, both for you and the association. Also, please kindly return this invoice with your payment.

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Dr. Richard I. Grauch, United States Geological Survey, Denver Federal Center
Mailstop 973, PO Box 25046 Colorado 80225 USA
Report of the IAGOD Working Group on Tin and Tungsten Deposits (WGTT) for 2002

PROFESSOR MIROSLAV STEMPROK, HONORARY LIFE MEMBER, THANK YOU!

Miroslav Stemprok, the WGTT chairman over many decades, heart and brain of organizing and publishing tin and tungsten metallogenic research within IAGOD, retired last year from this function. He will, however, continue to contribute actively to the ongoing activities of the group. The WGTT members at the Windhoek meeting gratefully acknowledged Mirek’s great contribution to develop the group over so many years and his remarkable research in Sn-W metallogeny. The group members attending the Windhoek business meeting approved Dr. W. David Sinclair (Geological Survey of Canada, Ottawa) unanimously as the new chairman of the group. Reimar Seltmann, Vice Chairman WGTT

Main results in 2002:


2) The main conference activity was focused on the organization of technical sessions on “Ore-bearing Granites” at the 11th Quadrennial IAGOD Symposium and Geocongress 2002 in Windhoek, Namibia, July 22-26, 2002. Contributions for these sessions, from WGTT and IGCP-373, were reviewed and edited by R. Seltmann, W.D. Sinclair and M. Stemprok. Extended abstracts were published by the Geological Survey of Namibia on CD-ROM.

3) The IGCP-373 project on “Ore-bearing granites of Eurasia”, closely cooperating with WGTT during the period of its funding (1997-2001, on extended term 2002) completed its research program with the session jointly convened with WGTT at the IAGOD Symposium in Windhoek.

Future activities:

1) WGTT members will continue to contribute to the compilation of a digital database on global tin and tungsten deposits, with the support of the World Minerals Project of the Geological Survey of Canada. This database is scheduled for completion in early 2004.

2) WGTT officers will play an active role in organizing a session on “New developments in tin, tungsten and rare metal deposits” at IGC 2004 in Florence, Italy, August 2004.

3) WGTT will play an active role in preparing the Interim IAGOD conference on “Metallogeny of the Pacific Northwest: Tectonics, magmatism and metallogeny of active continental margins” in Vladivostok in September 2004.

Contributed by David Sinclair, Chairman WGTT
Below is a complete list of presentations in Windhoek and contained on the CD volume of extended abstracts.

Alaabed, S.A.: Modeling the isotopic alteration of contrasted suites of rocks: results and implications.
Aïfa, T. & Lefort, J.P.: Location of the West African Craton according to preliminary Paleomagnetic data recorded in the Hunk Stromatolite-bearing Formation.
Ameglio, L., Jacob, R., Viljoen, W., Lorin, S., Roberts, M. & Reid, S.: 3-D dynamics of a calc-alkaline intrusion outlined by geophysical, geological, and remote sensing data (Etusis-Neikhoses pluton, Namibia).
Anhaeusser, C.R.: Ultramafic complexes along the northern flank of the Barberton Greenstone Belt, South Africa: Remnants of oceanic lithosphere along an Archaean Suture Zone?
Apollus, L., Bluck, B.J. & Ward, J.D.: The distribution of diamonds on a late Cainozoic gravel beach, SW Namibia.
Armstrong, R.: The Palaeoproterozoic changes to the Kaapvaal Craton during the "Bushveld" event: Timing and processes.
August, C.M., Esterhuizen, G. & Mackay, A.G.E.: The application of geophysical techniques in the delineation of diamond bearing shallow marine deposits.
Bargmann, C.: Geology and wine in the Vineyards of the Western Cape Province, South Africa.
Basson, I.J.: Optimisation of parameters for rapid low viscosity kimberlitic magma ascent through the lithosphere.
Basson, I.J. & Viola, G.: Kimberlite dykes: Active or passive magma emplacement?
Basson, I.J., Jelsma, H. & Viola, G.: Rapid kimberlitic fluid extraction from the mantle lithosphere.
Bauer, W. & Jacobs, J.: Juvenile late Mesoproterozoic terranes of heimefrontfjella (Antarctica) - Geochemical constraints for arc and back-arc volcanism.
Bisnath, A., McCourt, S. & Armstrong, R.A.: Correlation between the evolution of the Tugela and Mzumbe terranes, Natal Belt, South Africa.
Bogacz, W.V.: Extensional tectonic deformation and mineralisation model for the Telfer Au-Cu deposit (Proterozoic Paterson Orogen, Northern Western Australia).
Borg, G. & Armstrong, R.A.: Isotopic SHRIMP age dating of zircons from igneous basement and rhyolitic cover rocks at Skorpion, Southern Namibia.
Botha, W.J. & Alchin, D.J.: Interpretation of the airborne Dinghem geophysical survey data north of Rosh Pinah.
Burger, J.U.: Utilisation of scale model testing in the benchmarking and development of offshore sampling tools.


Castroviejo, E.T.S.: Genesisis and metamorphism of Cyprus-type massive sulphide deposits during Hercyninan collision, Cabo Ortegal Complex, NW Iberian Massif (Spain).


Cisternas, M.E., Jara, R. & Frutos, J.: Structural and lithological characteristics controlling the occurrence of gold-silver deposits in jurassic marine sediments of the Andean Cordillera, Copiapo, Chile.


Cook, N. & Ciobanu, C.: Bornite as carrier of exotic trace minerals.


Corner, B.: Ring structures of southern Africa.

Corner, B.: Structural mapping of Namibia derived from interpretation of geophysical and geological data.


Da Silva, M.G. & Teixeira, J.B.G.: The gold mineralizations of the Rio Itapicuru Greenstone Belt, Bahia, Brazil, and their genetic link with the Obuasi (Ghana) and Omai (Guyana) gold deposits.

de Bruin, J.D.: Pothole structures within the Bushveld Complex on Impala Platinum Mine.


de Waele, B. & Tembo, F.: Petrochemistry of magmatic rocks in the Irumide belt: Indications on the evolution and tectonic setting of the belt.

de Waele, B., Wingate, M.T.D. & Mapani, B.S.E.: Geochronological constraints on granitoid magmatism and deformation in the SW Irumide Belt, Zambia.


Distler, V.V & Yudovskaya, M.A.: New data on PGE mineralization of the Waterberg Deposit (South Africa) and some general problems of platinum ore formation under hydrothermal conditions.

Dunlevy, J.N. & Weinert, C.H-S.W.: Andalusite deposits of the Magudu - Louwsburg area, near Pongola, South Africa.


Ferrini, V. & Mignardi, S.: Gold in the polymetallic deposit of Munella (Northeastern Albania).

Fontboté, L. & Bendezú, R.: Zn-Pb mineralization in high sulfidation epithermal environments - examples from Peru.


Frimmel, H.: The glacial and interglacial record in the Gariep Belt: Enigma or Neoproterozoic sedimentation rates.

Frints, S. & Haapala, I.: The cretaceous gross Spitzkoppe granite stock in Namibia, a highly evolved a-type granite with structures and textures demonstrating magme flow, undercooling and vapor saturation during crystallization.

Frints, S., Poutiainen, M. & Haapala, I.: Greisen mineralization associated with the evolved Gross Spitzkoppe topaz-bearing granite stock, Western Namibia.

Garba, I.: Late Pan-African (600 ± 150 ma) tectonics and origin of mesothermal gold mineralization and rare-metal pegmatites in Nigeria. Evidence from the Kushaka schist belt.


Gauert, C.D.K.: Vertical and lateral chemical variation within selected sediment-hosted sulphide deposits in the Damaran
Fold Belts: Implications for vectors to mineralisation.

Gerel, O., Munkhtsengel, B. & Enkhtuvshin, H.: Mushgai Khudag and Bayan Khoshuu Complexes in South Mongolia: An example of potassic magmatism with carbonatites.

Goodfellow, W.D.: A Meteorite Impact Origin for Late Devonian Ni-PGE Sulphide and associated Tsunami Deposits, Northern Yukon, Canada.

Goodfellow, W.D.: The origin of Zn-Pb-Cu-Ag-Au massive sulphide deposits in the Bathurst Mining Camp, Northern New Brunswick, Canada.

Gower, C.F.: Late Paleoproterozoic and Mesoproterozoic evolution of the eastern Grenville Province and its northern borderlands in a metallogenic context.


Gray, R.: Proximal and distal relationship between coarse gravel beach remnants of the Plio-Pleistocene Orange River Delta.


Günzel, A. & Kamona, A.F.: Stratigraphy and mineralization in the Otavi mountainland, Namibia.

Hagni, R.D. & Shivdasan, P.A.: Paragenetic sequence of pyrrhotite alteration to marcasite, pyrite, magnetite, hematite, and goethite in pyroxene and pegmatitic carbonatites and fluorite ores at Okorusu, Namibia.


Han, U., Lee, M-B. & Yang, C-S.: Thermotectonic processes in the Coogaryung Rift Valley, Central Korea.


Harijoko, A., Watanabe, K., Duncan, R. & Izawa, E.: Hydrothermal alteration mapping and age mineralization in the Cibaliung area, western Java, Indonesia.


Hezarkhani, A.: The nature and origin of skarns associated with the Sungun porphyry copper deposit, Iran.

Hoffmann, D.: Structural control and metal zonation in the Selebi Phikwe Ni-Cu sulphide deposits, Botswana.

Jacob, R.J., Bluck, B.J. & Ward, J.D.: Orange River diamond placers: Age or setting?

Jacobs, J., Thomas, R.J., Fanning, C.M., Bauer, W. & Klend, R.: Collision, collapse and differential foreland exhumation of the East Antarctic / Antarctic orogen.


Johnstone, W., Corner, B. & Harris, C.: An aeromagnetic interpretation of western Dronning Maud Land, east Antarctica: Are zones of magnetization related to fluid alteration?


Kärner, K. & Borg, G.: Metallogenesis of non-sulphides and sulphides at the Skorpion zinc deposit, southern Namibia.

Kärner, K., Borg, G., Harney, D. & Hartmann, K.: A description of first ore minerals from the open pit at the non-sulphide
Skorpion Mine, Namibia.


Kazmin, V.G.: Summary of the tectonic history of the Namibian basement.


Khanachuk, A.I.: Mineral deposits of North Pathific orogenic belts.

Kiefer, R.: Geology and mineralisation model for the BIF-hosted lode gold deposit Abelskop - Amalia Greenstone Belt, South Africa.

Kigai, I.N.: Dubrovskoy tin deposit (Russia): Evolution of its genetic image from early exploration to exhaustion.

Kinnaird, J.: Gemstones of Somaliland: Sustainable development of the small-scale.


Kokonyangi, J., Armstrong, R., Kampunzu, A.B., Yoshida, M. & Okudaira, T.: Magmatic evolution of the Kibarides belt (Katanga, Congo) and implications for Rodinia reconstruction: Field observations, U-Pb SHRIMP geochronology and geochemistry of granites.


Komov, I.: Estimates of risk from environmental exposure to radon on uranium miners.

Kremenetsky, A.A.: The role of Sedex process as a constraint on the ore deposition and anomalous gold resources in the Witwatersrand Paleo-Basin.

Kříbek, B.: Weathering of fossil organic matter in spoil banks and tips of coal mines and quarries: Remediation aspects.

Kříbek, B., Žák, K., Pudilová, M., Sulovský, P., Hájek, A. & Holečky, D.: Geochemistry and timing of alterations in the Late Variscan, shear zone-hosted hydrothermal uranium deposit of Rožňa (Czech Republic).

Krymsky, R.Sh. & Belyatsky, B.V.: Nd-Sr isotope characteristics of rare-metal granitoids and ores as a possible indicator of scale of tin-tungsten deposit.


Kutina, J. & Taylor, P.: Satellite-based geopotential data integrated with the study of deep controls of mineralization, and targeting areas with potential for large concentration of metals.


Large, R.R.: Character and genesis of stratiform sediment host Au-Ag deposits, and implications for mineral exploration.


Lefort, J.P. & Aïfa, T.: Evidence for a circum-terrestrial loop of the APWP of the West African Craton between 2.2 and 0.9 Ga: Its temporary amalgamation to Columbia and Rodinia.


Lingenfelder, H. & Leicester, H.: Using a systematic approach to unlock new potential at the Thabazimbi Mine, South Africa.

Lobo-Guerrero, A.: Geology of the "Round Mountain" Gold Mine in Nevada, United States of America, and potential for exploration of similar deposits in the Andes.


Loris, N.B.T., Caillieux, J., Charlet, J-M. & Kampunzu, A.B.: Diagenetic remobilisation processes affecting the stratiform Cu-Co-Ni-U mineralization at Lusiwishi (Katanga, Congo).


Luettich, C., Borg, G. & Gauert, C.: Contemporaneous carbonate deposition and rhyolitic volcanism as a setting for...
syngenetic Pb-Zn-Cu-Fe sulfides at the Spitskop III volcanic dome, Rosh Pinah.

Maanijou, M.: Precambrian Mineralization of Iran.

Mackay, A.G.E.: The application of G.I.S. in the synthesis of data.


Mapani, B.: Interpretation of variograms from the Mberengwa Greenstone Belt: - Implications for mining and choice of blocks and its effects on mine economics.


Mikulski, S.Z.: The Radzimowice Au-Cu-As deposit from the Kaczawa Mts. - an example of alkaline-related gold deposit in the Polish part of Bohemian Massif.


Milne, G.: The late-orogenic A-type Oribi Gorge Suite - a possible model for the generation of A-type granites within an arc setting.


Morteani, G., Möller, P. & Preinfalk, C.: The metal-rich geothermal fluids of the Piancastagnaio / Monte Amiata geothermal area and the epithermal Sb, Hg (As, Au) deposits of southern Tuscany (Italy).


Mphupho, N.F. & Viljoen, M.J.: Environ. aspects associated with the past, present and future mining of the Central Rand.


Nex, P.A.: Bifurcating chromitites: analogues to sedimentary structures in the Bushveld Complex, South Africa.


Nyamai, C.M., Haapala, I. & Nguci, W.M.: A comparison of the uncomphagrite and turjaite mineralogy (phlogopite, mellite, etc.) of the south Nyanza district, western Kenya, with similar rock complexes in Asia, Australia and America.

Nyambe, I.A. & Finkelman, R.B.: Geochemistry of the Main Coal Seam of Gwembe Coal Formation (Permian), mid-Zambezi Valley, southern Zambia: Implication on coal usage and environmental impacts.

Ohtake, T., Yokoyama, T., Uchida, A., Watanabe, K. & Izawa, E.: Gold deposition in epithermal quartz-adularia veins: Experimental study on adsorption of gold on Al-Si systems.

Orberger, B., Paáva, J. & Gallien, J.P.: Se, As, Mo, Pt, Au, Cd traces in frambooidal pyrite, Ni-Fe and Zn-sulfides from Ni-Zn - Mo-Pge rich sulfide layers (Nick Property, Yukon, Canada): Preliminary nuclear microprobe results.


Osyczepalski, S., Niczyporuk, K. & Paslawski, P.: Gold, platinum and palladium in the Kupferschiefer, lower Silesia, SW
Poland.


Pașava, J., Kribek, B., Zák, K., Chaoyang, L. & Mingguo, Z.: Distribution of potentially toxic elements in soils and crop plants in areas of Ni-Mo black-shale hosted deposits (Zunyi Region, Guizhou Province, South China).


Preifalk, C., Morteani, G. & Huber, G.: The pegmatitites of the eastern Brazilian pegmatite province: Classification and mineralisation potential.

Prevec, S.A.: H2O: A functional analogue for continental margin rift tectonics?


Reimold, W.U.: Mineralization associated with impact structures, with special reference to the Vredefort-Witwatersrand System.


Rubide, B.S.: Reuniting lost continents Fossil reptiles from the ancient Karoo and their wanderlust.


Sakhno, V.G. & Moiseenko, V.G.: Plume volcanism of East Asia Cratons.

Salem, H.M.: Contaminated drinking water with heavy metals and their impact on human health, Cairo Egypt.

Sanematsu, K., Watanabe, K., Sekine, R., Duncan, R. & Izawa, E.: 40Ar/39Ar geochronology of quartz-adularia veins in the Hishikari epithermal gold deposit, Japan.


Schneider, G.: The Sperrgebiet land use plan - an example of integrated management of natural resources.


Seabrook, C.L., Prichard, H.M. & Fisher, P.C.: Platinum-group mineralogy in the Katinniq and zone 2 orebodies, Raglan Ni-Cu-(Pge) sulphide deposit, Cape Smith, Canada.

Seltenmann, R., Yakubchuk, A. and Shatov, V.: Mineral potential of Central Asia: What do we know?


Shaw, M.: Shelf development of the Chameis Bay area during the eocene and oligocene: Implications for diamond placer development.

Shivdasan, P.A., Hagni, R.D. & Mariano, A.N.: Character, paragenetic sequence and origin of the carbonatite host rocks for the fluorite deposits at Okorusu, Namibia.


Shmakin, B.M.: Paragenesis of rare minerals in granitic pegmatites as a result of intense element concentration in closed systems.


Sikazwe, O.N., Koller, F., Abart, R. & Kamona A.F.: Geology and geochemistry of the Marie Copper sulphide deposit, Mumbwa District, Central Zambia.


Stalder, M. & Rozendaal, A.: Petrographical and geochemical characteristics of the Gamsberg barite deposit and its
relationship to Broken Hill-type Zn-Pb mineralisation.


Thomas, R.J., Armstrong, R.A. & Grantham, G.H.: Dating formation of the Semail ophiolite in Fujairah, United Arab Emirates.

Thompson, R.N., Smith, P.M., Gibson, S.A., Mattey, D.P. & Dickin, A.P.: Ferrocarbonatites; Magma or Myth? Evidence from Swartbooisdrif, NW Namibia.


Turner, B.R.: A new exploration model for lower permian heavy mineral sandstones along the northern margin of the Karoo Basin: Where is the gold?.


Viljoen, W.G.: Copper-gold mineralisation in the Onguati area, Karibib district, southern central zone, Namibia.


Walters, S.G.: Advances in micro-analytical techniques New exploration applications using indicator minerals.

Walters, S.G.: An overview of world-class Broken Hill-type Pb-Zn-Ag deposits - New lessons from old ore bodies.


Wieland, F.: Geology and structural setting of the Jamieson Window, Mt Useful Slate Belt, Victoria Australia.


Winter, H. de la R.: Gondwana break-up process controls fossil fuels, diamonds, gold and other resources.

Winter, H. de la R., Cheney, E.S. & van der Westhuizen, W.A.: Sequence chronostratigraphic analysis of the Kaapvaal Province, southern Africa: Responses to 3-2 Ga plate tectonics and magmatism.

Wiszniewska, J., Duchesne, J-C. & Doerr, W.: Titanomagnetite and Cu-Co-Ni sulfide mineralization in the Suwalki and Sejny AMCG Complexes, NE Poland.


Zühlke, R., Bechstädt, T & Mundil, R.: Integrated cyclostratigraphy of a model mesozoic carbonate platform - the Latemar (Middle Triassic, Italy).

Zühlke, R., Bouaouda, M-S., Ouajhain, B., Bechstädt, T & Leinfelder, R: Quantitative Meso-/Cenozoic development of the eastern central Atlantic continental shelf, onshore Agadir Basin, Morocco.

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1. Discussions and workshop meetings

Scientific reports of WG5 members:


Antipov V.S. Satellite-used GIS evaluation for potential value of the earth’s crust blocks.


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Pertsov A.V, Antipov V.S., Galperov G.V., Turchenko S.I. Lineament net controlling distribution of superlarge mineral deposits in Russia. Remote Sensed Institute for Geology (NIIKAM), St. Petersburg, Russia. (e-mail: vniikam@mail.wplus.net)

Deciphering of structural units of remote sensing data for the Geological map of Russian Federation territory, using space image composed in NIIKAM from NOAA AVHRR images of EROS Data Center within spectral bands at 580-680 and 720-1100 nm, allows the net of global and regional deep-rooted lineaments to be revealed. The lineaments extend from 5400 up to 500 km in latitudinal, longitudinal and diagonal directions over Russian territory and neighboring countries. The distribution of lineaments in RF territory is uneven, maximum concentration of complex combinations of diversely directed lineaments is observed between 80°E and 140°E (region of East Siberian plate and its folded frame). The mentioned lineaments can relate to global system of upper crustal stresses induced by age-long Earth’s rotation and, accordingly, by fluctuations of deep geospheres rotation. The existence of continental lineaments, which are possibly touching the sub-lithospheric mantle horizons, can be explained by an uplift of low-velocity high-temperature masses upcoming from lower mantle boundary caused by upwelling of giant streams - plums of hot lower mantle substance.

Geodynamic approach of that kind explains the attachment of large and superlarge concentrations of metals in mineral deposits (heterogeneous in genesis, mineral substance and age of forming) to the intersections of diversely directed continental lineaments. Our investigation envelops more than 30 Russian mineral deposits of such kind bearing Au, Ag, Pt, REE, U, Nb, Ta, Sn, Pb, Zn, Cu, Ni, Cr, Fe,
rare earth elements and diamonds. 
The cross-clusters of continental lineament net are characterized by maximal tectonic stress in deep 
lithosphere linked with subcontinental mantle convective cells and their boundaries. The deep fluid and 
energy flows from lower mantle source relate to such convective cells and, accordingly, with plum-
tectonic phenomena subjecting substance migration and its subsequent concentration in the form of giant 
and unique mineral deposits in upper crust.

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Antipov V.S. Ore-controlled anomalies of land areolas activity (metallogeny of endodynamic anomalies). 
Remote Sensed Institute for Geology (NIKAM), St.-Petersburg, Russia

New trend of metallogeny - investigation of regularities ore objects location relatively areas of modern 
lithospheric activity. Such kind areas are fixed by anomalies revealed during research works with using of 
special modification geophysical, geochemical and aerospace methods study of the Earth. The anomalies 
that have been detected of these methods are determined as endodynamic and trend of its metallogenic 
analysis was named metallogeny of endodynamic anomalies

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Antipov V.S. Satellite-used GIS evaluation of potential value of earth’s crustal blocks. 
Remote Sensed Institute for Geology (NIKAM), St.-Petersburg, Russia. (e-mail: vniikam@mail. wplus.net)

Modern methods for processing and deciphering of remote sensing data allow the determination of ore-
controlling and ore-bearing spectral band of separate part of territory for prospecting. Most effective 
expedient for determination of metallogenic appurtenance and potential resources ore-perspective parts of 
territory (by the data of remote sensing mapping) is its geochemical characteristic. The thematic layers for 
ore-bearing prognoze maps are formed on these geochemical databases.

Thematic layers of mineragenic maps in GIS-technology are formed the fails of local database. Its 
combination for final conclusion on common potential value of earth’s blocks (PVEB) are carried out by 
using of different information on potential resources in region and a cost of mineral raw materials 
(MRM). Determination of favorable invest requires consideration of MRM marketeering, outlay for 
prospecting and excavation of ores as well as geographical and social-economic features of region.

Important is evaluation of PVEB during allocate funds from federal budget for forecasting, prospecting 
and evaluating processes and accepting of resolution for development of mineral deposits.

In modern time an express and enough cheap remote sensed geological methods of prognoses ore-bearing 
territories are especially actual, on account of limited funds and time to permit complete cycles of 
traditional prospecting.

One from these methods is satellite-assisted hydrogeochemical river-basin mapping of territories having 
anomaly of spectral bands brightness (ASBB) that is evidenced at ore-perspective style the territory under 
consideration. Using such methods the separate parts of region can be evaluated for PVEB in 
collaboration with GIS-technology processing of remote sensing and mineral resources data.

Initial prognoses resources of territory can be determined by law-governed maximal ore-concentration 
(LMOC) as accumulation index - Q KB. Accordance with corridors of mineral deposits size theoretical 
account of mine reserve is possible for: giant, large, middle and small mineral deposits. The analysis of 
the digital data also shows that, at present, we do not yet find giant deposits of Mg, K, Na, Ba, F, Sr, B, 
Nb, Zn, Li, Cu, W and Be. Is it possible that such deposits will be found in the 21st Century. The 
thoretical size (in tonnes) of mineral deposits: supergiant \(10^{11}\cdot10^{12}\) KB, giant \(10^{10}\cdot10^{11}\) KB , large 
\(10^{9}\cdot10^{10}\) KB, medium \(10^{8}\cdot10^{9}\) KB, small \(10^{7}\cdot10^{8}\) KB, very small \(10^{5}\cdot10^{7}\) KB and occurrences \(10^{5}\- 
10^{6}\) KB. Using the LMOC and signs of local clarks it is possible evaluate potential resources largest 
mineral deposit in region.
As example the account of PVEB is regard for Pechenga ore district at Kola Peninsula. Hydrogeochemical mapping were covered 2500 km² of this ore-bearing region including the Pechenga volcanic structure, with 11 Cu-Ni deposits, and the neighboring area. Every hydrogeochemical test gave characteristic of 150 km² square in average and was analyzed for 70 elements by ICP-MS methods. The value of ore potential Pechenga region (now yet non-accounted for Pt, Pd, Au, REE and W) will come to more then 7 billion US dollars after account of double increasing minimal resources and stock-taking market cost for 1 ton of Pt, Pd, Au, REE and W.

GIS-technology, together with processed remote sensing data allows in future to account specific PVEB for every metal and in common. This method gives a possibility to show economic features for every unit of square in researching regions.

Contributed by S. Turchenko, Secretary WG5 CTOD (vniikam@mail.wplus.net)

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Report from the Kazakhstan National IAGOD Group for 2002

Conference participation in 2002 (IAGOD members participating with oral presentation are indicated in brackets):


Major scientific publication:

The main event in activity of Kazakhstan National IAGOD Group in 2002 was a publication of Atlas of Lithological-paleogeographical, Structural, Palinspastic and Geovironmental Maps of Central Eurasia. Publisher: Scientific Research Institute of Natural Resources YUGGEO. Kazakhstan, Almaty, 2002. 69 lists.

The vast region (some 7.5 million km²) includes 14 oil basins - Volga-Ural, Precaspian, South-Caspian, Aral, North-Caucasus-Mangyshlak, North Ustyurt, Amudarya, Afgan-Tajik, South-Turgay, Chu-Sarysu, Fergana, Tarim, Junggar, Turfan, as well as major mining areas such as the South Urals, Tian Shan, Central Kazakhstan, Pamir and Altay.

The project focused on the geology, ecology, oil, gas and mineral resources of Central Eurasia, was initiated in 1996 and sponsored by the governments of Azerbaijan, China, Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan and Uzbekistan. Professional input for the Atlas has come from more than 200 experts from 23 geological organizations. The main co-ordinator of project was a Director of
Institute YUGGEO O.A. Fedorenko. The Editorial Board of Atlas included the Kazakhstan National IAGOD Group members V.F. Dolgopolov, Kh.A. Bespaev and M.S. Rafailovich.

The Atlas is bilingual (English and Russian).

A comprehensive version in digital formats ArcView and CorelDraw, will be made as a CD consists of as follows:

- **Lithology-paleogeographical maps** (1:2,500,000 scale) were compiled for 43 stratigraphic levels from Riphean to Pliocene. These maps show current position of the geological bodies, composition, stratal thickness, paleogeographical and paleotectonic evolution and mineral deposits and etc.

- **580 historic-geological sections** made the base for Lithology-Paleogeographical maps. They contain various information on stratigraphy, paleogeography, composition of sediments, as well as oil, gas and other minerals location.

- **Two structural maps** (1:2,500,000 scale) for the sedimentary cover and the top of the basement. These maps are based on seismic, borehole and other data.

- **Palinspastic maps** (1:10,000,000 and 1:20,000,000 scale) were compiled for 23 time levels from Riphean to Early Paleozoic on the basis of lithology-paleogeographical maps, paleomagnetic data.

- The map of **Main tectonic elements** (1:5,000,000 scale) shows terrains, shear zones, volcanic belts, sedimentary basins, including petroliferous basins, and typical ore fields.

- **Two geoeological maps** (1:2,500,000 scale) depict natural parameters and indices of the geological environment (lithosphere, hydrosphere), natural and man-made impact processes.

- **Explanatory note.**

Printed short version (hardcover book, size 420x340 mm) comprises as follows: 18 Lithology-paleogeographical maps; 280 Historic-geological sections; Structural map for the top of the basement; 17 Palinspastic maps; the map of Main tectonic elements; map of geo-environment rating and hazardous anthropogenic changes; explanatory note.

**Other selected publications**


Yartseva L.A. (2002). Necessity of Application of Oil Geochemical Searches of Precaspian Region - In: Oil and Gas. № 3.

Planned activities for 2003-2004

1. New publications (articles, monographs, methodical recommendations) in the sphere of the genesis of ore deposits (national and international magazines and journals).

2. Participation in International Scientific Meetings, Conferences and Field Excursions (Kazakhstan, Russia, Uzbekistan, China and others).

3. Cooperation with other IAGOD National Groups (Kyrgyz, Uzbekistan, Russia et al.) on the basis of International project "Geology, Geodynamics and Metallogeny of Central Eurasia".


Current list of members of the Kazakhstan IAGOD National Group (January 2003)

Chairman: Prof. Mikhail Rafailovich (Scientific Institute of Natural Resources YUGGEO, Bogenbay Batyr Str., 168, 480012, Almaty, Republic of Kazakhstan. Tel.: (3272) 692240; fax (3272) 621284; e-mail: rafail@astel.kz.

Prof. Bespaev Kh.A. (Almaty), Dr. Fedorenko O.A. (Almaty), Dr. Glukan I.V. (Karaganda), Prof. Dyachkov B.A. (Ust-Kamenogorsk), Dr. Dolgopolov V.F. (Almaty), Dr. Dosanova B.A. (Almaty), Prof. Los V.L. (Almaty), Dr. Nachtigal G.P. (Ust-Kamenogorsk), Prof. Serykh V.I. (Karaganda), Dr. Sapargaliev E.M. (Ust-Kamenogorsk), Dr. Yartseva L.A. (Almaty).

Contributed by Mikhail Rafailovich, chairman, e-mail: rafail@astel.kz

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The Russian Far East IAGOD Group, being a part of the National IAGOD Group of Russian Federation, has 18 members.

The main events in activity of Far East Russian IAGOD group in 2002 were:

1. 2004 Interim IAGOD Conference:

Preparation of the 2004 Interim IAGOD Conference on Metallogeny of the Pacific Northwest: Tectonics, Magmatism and Metallogeny of Active Continental Margins in September 11-19, 2004 in Vladivostok (Russia). The group prepared for publishing the eight guide booklets for the planned field tours and distributed the first circular in different countries.

NEWS: The following new sessions are proposed:

“GIS and the Database in a Metallogeny and Tectonics”. Convener: V.V. Naumova.

Trip D: “Kuril Islands” is cancelled.

2. Participation in conferences etc.:

Organization and participation in scientific conferences and symposia.

- 11th Quadrennial IAGOD Symposium and GEOCONGRESS 2002 in Windhoek, Namibia. The Chairman of the Russian Far East IAGOD Group, A.I. Khanchuk took part in it.

- International Workshop “Deep-Seated Magmatism, Magmatic Sources and the Problem of Plumes” 2002 held during September in Vladivostok. This Workshop was organized by the Far East Geological Institute of FRB RAS. Some members of IAGOD participated in it.

3. Participation in International projects:

The Chairman of our IAGOD group, A.I. Khanchuk, took part, as one of the leaders, in the International project “Mineral Resources, Metallogenesis and Tectonics of NE Asia”. The project also involves collaborating agencies from U.S.A, Russia, Mongolia, China, Korea, Japan and other countries.

G.A. Gonevchuk, P.G. Korostelev and B.I. Semenjak took part in a joint project between the Geological Survey of Canada and IAGOD Working Group on Tin and Tungsten Deposits (WGTT) under the title “Tin and Tungsten Deposits of the World”.

Many members of the group are involved into the projects of the Russian Fundamental Studies Foundation studying the ore deposits genesis.

The monographs of IAGOD members:


Genesis and evolution features of ore-magmatic systems with various types of tin mineralization are characterized by the research results magmatic associations and the related postmagmatic formations of the most significant in the Russian South East tin districts - Komsomolsk, Badzhal, Kavalerovo, Khingan-Olono, and other research data generalization. Descriptive and graphic models of the investigated systems and the scheme of their interconnected evolution are developed as the Cretaceous-Paleogene regional OMS elements. Some geochemistry aspects of tin in magmatic processes are reviewed. The analyzing are opportunities of magmatic criteria application to reveal and estimate heterorank tin-bearing systems.


In the monograph, the peculiarities of geological structure and mineral composition of ores of the Khakandzhinskoe gold-silver deposit are discussed. Such peculiarities are as follows: the concentration of ore groundmass in gently pitching vein-metasomatic zones of complicated structure; a clear restriction of ore-bearing zones to the near-vent part of a paleovolcanic edifice formed in several phases of volcanic activity; availability of areas of "combination" and "separation" of the aureoles of hydrothermal-metasomatic alteration of rocks and development of productive mineralization; wide distribution of manganese-bearing minerals in primary ores; presence of oxidation zone on the upper and middle horizons of the deposit. Geological position of the Khakandzhinskoe gold-silver deposit is defined by its restriction to the paleovolcanic edifice formed in the Late Cretaceous stage of development of the Okhotsk branch of the Okhotsk-Chukotka volcanic belt. Characteristic of the Khakandzhinsky paleovolcano area is a wide occurrence of rudaceous pyroclastic accumulations (agglomerate breccias, psephitic tuffs, tuff ignimbrites) and several different-time extrusive-effusive bodies of dacite, rhyodacite, and rhyolite composition, which successively accrete the section. The boundary of distribution of extrusive bodies and fluidal lava flows controls the position of economic mineralization in the vein-metasomatic bodies of the Khakandzhinskoe ore field. Gold and silver in ores of the deposit are
concentrated in two mineral complexes: quartz-adular and quartz-rhodochrosite-carbonate. The minerals of the gold-silver row are the latest formations of the productive parageneses in both complexes. The book is expected to be interesting for a wide circle of geologists studying ores.


The paper concentrates on the characteristics of the Late Mesozoic-Cenozoic Volcanism belts of East Asia, their matter composition, structural position, and geodynamic formation. The new type of plume volcanism is distinguished. Petrochemical, geochemical, mineralogical, and isotopic (Sr, Nd, Pb) characteristics of magmatic complexes of plume volcanism zones are described. Ore origin and the influence of deep-seated (mantle) sources on magma genesis are investigated using the new isotopic and REE spectra. The paper also deals with the effect of fluids, halogens (F, Cl) for the first place, on the formation of ore-magmatic systems and their potential ore content. A new model of magmatism and active margin geodynamic structures is proposed. The paper is intended for specialists in volcanism, petrology, and metallogeny, it is also might be used by geology students.

Selected publications


Rasskazov S.V., Ivanov V.V., Khanchuk A.I., Chashchin A.A., Fefelov N.N., Saranina E.V. (2002) Isotopic heterogeneity of the galenas lead from ore deposits of Primorye. Doklady Russian Academy Nauk. vol. 387,
The Commission on Ore Deposits in Mafic and Ultramafic Rocks (CODMUR)

Report on the IGCP 427 project Dynamic Processes in Ore-Forming Magmatic Systems

The main meeting for this year was the 9th International Platinum Symposium held in Billings, Montana, USA. This was a great success with 200 registrants, 67 oral presentations, 61 posters and an abstract volume containing comprehensive extended abstracts. Many aspects of platinum mineralisation from magmatic concentration to environmental pollution were covered. There were papers on the Bushveld and PGE deposits in Canada, Russia, Brazil, Finland, India and China. The final morning of the conference was devoted to papers on the mining and development of the PGE reef in the Stillwater complex located near to the conference venue in Billings. This was followed by field excursions to the Stillwater mine to examine the progress with mining of the Pt from the Stillwater layered complex. This has been developed since the excursions associated with the 4th International Platinum symposium held in Toronto in 1985. Pre-conference field excursions also included trips to Stillwater and in addition to some of the classic hydrothermal PGE deposits that occur associated with the intercontinental rift centred on Lake Superior including visits to PGE mineralised sites at the base of the Duluth complex in the USA and then into Canada to the Two Duck Lake contact PGE mineralisation and the Lac Des Isles complex which is being mined commercially for PGE.

A business meeting was held at the 9th International Platinum Symposium for the IGCP project 427 and this was attended by many of the conference delegates. It was felt that a wide discussion was necessary as this IGCP project was coming to a close and we needed to look to the future. It was agreed that a conference volume for the 9th International Pt Symposium would be a special issue of Canadian Mineralogist edited by Jim Mungall and Bill Meurer.

A new proposal was submitted to IGCP in October 2002 entitled “Sustainable Use of Platinum Group Elements in the 21st Century: Risks and Opportunities” by Dr. James E. Mungall (University of Toronto, Canada), Dr. Markku J. Iljina (Geological Survey of Finland), and Prof. Dr. César Fonseca Ferreira-Filho (Universidade de Brasilia, Brazil).

Professor Sarah-Jane Barnes agreed to continue to run the Magsul eMail group.
sarah-jane_barnes@uqac.uquebec.ca

A list of potential future meetings was brought to people’s attention:-
2003: 7th International SGA meeting in Athens
2004: Florence IGC with a field meeting to the Ivrea zone in Italian Alps
2005: 10th International Pt Symposium: Finland with excursions to PGE and Chromite deposits, within Finland to Kemi and other layered intrusions and to the Uralian Pt belt. This conference will be associated with the 5th International Dyke Conference.
Dr. Mike Zientek of the USGS gave a brief account of a new 5-7 year USGS initiative to assess global resources. Initial metals to be studied will include PGE. The information gathered will be in the public domain and information about resources will be at the 1-2 million scale. The project will include ore deposit modelling and assessment methods. The collection of information will rely on working groups with international participants. There will be some funds for bringing people to workshops.

Mike Lesher and Sarah-Jane Barnes were thanked for their leadership of this current IGCP project 427.

Contributed by Hazel Prichard (CODMUR Secretary & UK representative for project 427; sghmp@cardiff.ac.uk)

ANNOUNCEMENT

International Conference and Field Excursion

Geodynamics and metallogeny of Mongolia

July 30 - August 7, 2003
Ulaanbaatar and Oyu Tolgoi, Mongolia

Sponsored by: Mongolian University of Science & Technology, Geoscience Center, IVANHOE Mines, CERCAMS, Department of Mineralogy, Natural History Museum, London

In cooperation with: International Association on the Genesis of Ore Deposits (IAGOD), National IAGOD Group of Mongolia / National IGCP-473 Group of Mongolia, Institute of Geology and Mineral Resources, Mongolian Academy of Science, Geological Association of Mongolia, Mineral Resource Authority of Mongolia

Workshop: July 31-August 1, 2003

Conference Venue:
Mongolian University of Science & Technology
Baga Toiruu
Ulaanbaatar 210646

Topics:
- Tectonics and metallogeny of Mongolia
- Island arc and active continental margin geology and mineralization
- Granitoid-related mineralization

Details of the Scientific Program and field excursion (2nd-6th August 2003) can be found on http://www.nhm.ac.uk/mineralogy/cercams/activities/CIRCULAROyuTolgoi.doc

Registration Fee
The full registration fee (US$ 650.-) includes field accommodation, field transportation from and to Ulaanbaatar, all meals in the field, conference lunch and reception in Ulaanbaatar, Excursion Guidebook and Abstract Volume.

Publication
Excursion Guide (IAGOD Guidebook Series) and Conference Proceedings (Abstract Volume) will be published.

Deadlines and key dates:
Abstract submission and payment 15 April 2003
Confirmation of participation 15 May 2003
ANNOUNCEMENT

Paleozoic Geodynamic Processes and Metallogeny of the Chinese Altay and Tianshan

IGCP-473 Field Symposium in Urumqi
August 9-21, 2003

Sponsors:
China Geological Survey, China University of Geosciences (Beijing), China Natural Science Foundation, IGCP-473 Project “GIS Metallogeny of Central Asia”, The Society of Economic Geologists (SEG), The Society for Geology Applied to Mineral Deposits (SGA), International Association on the Genesis of Ore Deposits (IAGOD), CERCAMS, Department of Mineralogy, Natural History Museum London

Organizing Committee
Honorary Chairman: Shou Jiahua
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INVITATION
You are cordially invited to attend the IGCP-473 symposium and field excursion, to be held in the Altay (Altai) and western Tianshan of northern Xinjiang, China. The program will include a workshop focused on scientific discussions of the metallogeny and regional geology of this part of Central Asia, and field excursions to a variety of important ore deposits and key geological outcrops within this region of exceptional natural beauty. The workshop will include specific sessions on

(1) the tectonic evolution of Xinjiang within the greater geologic framework of Central Asia,
(2) pre-accretionary mineral deposits, and
(3) syn- to post-accretionary mineral deposits.

The diverse metallogeny will allow visits to important orogenic gold, epithermal gold, Cu-Zn-Au VHMS, and granitoid-related rare metal and mafic-ultramafic Cu-Ni-PGE deposits that formed within this complex accretionary orogen. The workshop and field trip include 2 days of sessions in Urumqi, the capital of the Xinjiang Uigur Autonomous Region, and 11 days of post-symposium field excursions.
PROGRAM AND VENUE
The Symposium will be held in the Tunhe Hotel, 52 Changjiang Road, Urumqi City, close to the Xinjiang Bureau of Geology, Mineral Resources, Exploration and Development.
Opening Ceremony and Invited Reports: August 9, 2003
Oral presentations: August 10, 2003
Scientific topics:
A) Magma-related Cu-Fe-Ni-Rare Metal deposits in Pre- and Post-Collision Regimes
B) VHMS-Type Cu-Zn-Pb-Au Deposits in Rifting Environments
C) Orogenic and Epithermal Gold Deposits in Late Paleozoic Orogenic Belts
D) New Prospecting Methods and New Discoveries

FIELD EXCURSION (August 11-21, 2003)

<table>
<thead>
<tr>
<th>Date</th>
<th>Routine</th>
<th>Geology</th>
<th>Hotel</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUG 11</td>
<td>Urumqi City → Fuyun County (480km)</td>
<td>Kalatongke Cu-Ni deposit near Fuyun - afternoon</td>
<td>Fuyun Hotel**</td>
<td>Depart at 8:30 a.m., Lunch in Fuyun or Wucaiwan, at ~ 4 p.m.</td>
</tr>
<tr>
<td>Aug 12</td>
<td>Fuyun → Keketuohai → Fuyun</td>
<td>The famous No.3 pegmatite open pit (closed site)</td>
<td>Fuyun Hotel**</td>
<td>Depart at 9:00 a.m., Lunch in Keketuohai</td>
</tr>
<tr>
<td>Aug 13</td>
<td>Fuyun → Keketale → Fuyun</td>
<td>Keketale Pb-Zn deposit and Mengku Fe deposit</td>
<td>Fuyun Hotel**</td>
<td>Depart at 9:00 a.m., Field lunch</td>
</tr>
<tr>
<td>Aug 14</td>
<td>Fuyun → Altay City</td>
<td>Fuyun→Altay in the morning, Shangkelan rare metal deposit and granite in the afternoon</td>
<td>Altay Hotel in Altay City**</td>
<td>Depart at 9:00 a.m., Lunch in Altay</td>
</tr>
<tr>
<td>Aug 15</td>
<td>Altay → Habahe County</td>
<td>Pt strata, deformation, metamor- phism and pegmatite - morning, Shaidu gold deposit - afternoon</td>
<td>Habahe Hotel**</td>
<td>Depart at 9:00 a.m., Lunch in Habahe</td>
</tr>
<tr>
<td>Aug 16</td>
<td>Habahe → Ashele</td>
<td>Ashele VHMS Cu-Zn deposit - morning, Dulanasyi Au deposit - afternoon</td>
<td>Habahe Hotel**</td>
<td>Depart at 9:00 a.m., Lunch in Ashele</td>
</tr>
<tr>
<td>Aug 17</td>
<td>Habahe → Hanasi → Bu’erjin</td>
<td>PT metamorphic rocks and Hanasi high mountain lake</td>
<td>Friendship Peak Hotel***</td>
<td>Depart at 8:30 a.m., Lunch in Hanasi</td>
</tr>
<tr>
<td>Aug 18</td>
<td>Bu’erjin → Yili City (1000km)</td>
<td>Ghost City and Gobi site on the way</td>
<td>Taoyuan Hotel***</td>
<td>Depart at 8:00 a.m., Lunch in Kelamayi (?)</td>
</tr>
<tr>
<td>Aug 19</td>
<td>Yili → Arxi (100km)</td>
<td>Arxi gold deposit</td>
<td>Taoyuan Hotel***</td>
<td>Depart at 9:00 a.m., Field lunch</td>
</tr>
<tr>
<td>Aug 20</td>
<td>Yili → Yilmend (320km)</td>
<td>Yilmend gold deposit</td>
<td>Taoyuan Hotel***</td>
<td>(depends on road situation)</td>
</tr>
<tr>
<td>Aug 21</td>
<td>Yili → Urumqi (700km)</td>
<td></td>
<td>Tunhe Hotel****, Urumqi</td>
<td></td>
</tr>
<tr>
<td>Aug 22</td>
<td>Departure from Urumqi</td>
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</tbody>
</table>

The August 2003 field excursion in northern Xinjiang will give participants the opportunity to develop a better general understanding of the Paleozoic geology of this part of Central Asia and the relationship of its geology to the distribution of some of the most important recently discovered mineral deposits. This excursion will include visits to a series of different syngenetic and epigenetic deposit types and related geological features. These include the Kalatongke Cu-Ni-PGE deposit associated with mafic-ultramafic intrusive complexes emplaced along deep faults, the world famous Keketuohai No. 3 pegmatite (Li-Be-Nb-Ta-Cs-Zr-rich bodies with gem quality tourmaline and aquamarine), Keketale Pb-Zn deposit, Mengku Fe skarn, Altay granite-hosted rare metal deposits, Ashele VHMS Cu-Zn deposit, and Dulanasyi and Saidu orogenic gold deposits. These deposits are mainly located along the southern margin of the Altay Mountains and are relatively easily accessible by motorized vehicles. The Arxi and Yilmend epithermal gold deposit is the site of the largest active gold mine in western China, located in the western Tianshan Mountains, to the south of the Altai and across an extensional basin between the two ranges. The field trip will focus on the Hercynian deposits and their geological setting, observing their field features and relating their genesis to the Hercynian orogenic processes, which is typical of much of Central Asia. However, Pre-Cambrian metamorphic terranes and post-Hercynian rocks and ore deposits will also be examined along the trip route.
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And soon to be published…..

Excursion Guidebook of the IGCP-473 Field Conference in Urumqui and the Chinese Altai and Tianshan: 9-21 August 2003)

Metallogeny of Cu-Au-Ni-Fe-Rare Metal Deposits and Related Geodynamic Evolution of the Altai and Tianshan in Northwestern China

Editors: Jingwen Mao, Richard Goldfarb, Reimar Seltmann, Wenjiao Xiao, Denghong Wang
Academic Advisors: Guanchi Tu, Yu Chuan Chen, Shu Sun, and Xuchang Xiao

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6. Metallogenic series and metallogenic regularities in Altai .................................................. Wang D., Chen Y., Xu Z., Li T.
7. Pegmatite rare metal deposits in Altai .............................................................................. Wang D., Zou T.
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9. Keketale VHMS type lead-zinc deposit in Altai ........................................................................... Wang J.
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11. Saidu and Duonasayi orogenic gold deposits in Altai .................................................................. Liu Y.
12. Mengku iron-copper deposit in Altai ...................................................................................... Wang J.
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14. Copper and gold deposits in eastern Tianshan ................................................................. Qin et al.
15. Tuwu - Yandong porphyry copper deposits in eastern Tianshan .............................................. Rui Z., Mao J., Han C., Wang L.
16. Shiyintan epithermal gold deposit in eastern Tianshan ........................................................................... Zhang L.
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Problems of Ore Deposits and Maximizing the Prospecting Efficiency

October 21-24, 2003

Tashkent, Uzbekistan
Report of the Tajik National IAGOD Group for 2002

Output and future plans

The main activity of our group has been collaboration with holders of grant projects. Our first joint project was with the Institute of Geography, University of Berne (Prof. Hans Hurni, Co-director of the Centre for Development and Environment), which involved us in the Pamir Strategy Project (PSP/CDE) for a review on mineral deposits in Pamir Mountains, its economic potential and real significance. The result was a series of collective compilations, in which the Tajik IAGOD group contributed with consulting, editing and technical support:

- Mining potential of Pamirs (Vladislav E. Minaev, co-author/editor)
- Natural hazards of Pamirs (Vladislav E. Minaev, co-author/editor)
- Interactive GIS-map of main mining districts (R.D. Bahtdavlatov, co-author/editor)

Results were published briefly in: “Analysis of sustainable development in Pamir Mountains, Tajikistan” - Khorugh, 2002, pp. 61-67 and 76-80. The project was financed by Swiss Agency for Development and Cooperation; breu@giub.unibe.ch - PSP Coordinator.

Scientific collaboration with University departments in Germany and the USA is fruitful and moving forward along two main themes: a) deep-seated xenoliths from Neogene alkali basalts of East Pamir - Tibet (the problem of super-thick Earth Crust); b) magma belts of the Tien- Shan - Pamir - Tibet region. Supporting persons are Prof. Lothar Ratschbacher (Bergakademie Freiberg), Dr. Mihai Ducea (University of Arizona), Dr. Bradley Hacker (University of California). The Tajik IAGOD group are represented by Valery Lutkov and Vladislav Minaev.

Some publications are:


Boris A. Revazov (member of TajikIAGOD group) has prepared an interesting application for the analytical control of dressing technology in the Tajik-Canadian joint venture project on the Aprelevka Gold Deposit. He has proposed to analyze the gold of high content sorbed in activated coal (after CN-acid process) by express atomic-absorption method. A reduction of the time for analysis gives great economic benefits, due to special know-how based on the inventions of B.A.Revazov (“Mode of injection of matter in atomizing device in time of atom-absorption analyze”, Russian-patent No 2018805; “Mode of atomization of sample by atom-absorption and device for this operation”, Russian-patent No 2094760). The technological know-how developed contributes to the scheme for the preparation of the tested sample and content of burned batch. The mode of gold-dressing control is beneficial for the dressing-plant’s expenditures through time savings.

Contributed by Vladislav Minaev, Chairman of TajIAGOD Group, PO Box 198, Dushanbe 734025, Tajikistan
## IAGOD Council (2000-2004)

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</tbody>
</table>
A Case Study of the Metallogenic Province and Ore-forming Chronology in the Northern Margin of the North China Platform and its North Side

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Institute of Mineral Resource, CAGS, Beijing, 100037, China
Ye Jinhua
The Development and Research Center, CGS, Beijing, 100083, China

*peirf@sohu.com
ABSTRACT: The evolution of metallogenic provinces and ore-forming chronology are important topics of research. The metallogenic province in the northern margin of the North China Platform and its northern side (NMNCP) is located at the intersection of a Precambrian massif with ancient Asian orogenic belts and also marginal-Pacific tectonic belts. This paper provides an evaluation of the metallogeny of the NMNCP and its geological evolution, as a means to advancing our understanding of the evolution of metallogenic provinces and to developing a new method to study ore-forming chronology.

1. Hierarchical and Systematic Metallogeny of the Metallogenic Province

The concept of metallogenic provinces was first described early in the last century (de Launay, 1913; Lindgren, 1909; Turneaure, 1955). Since then, this concept has changed greatly, and has evolved into a new idea that various ore-controlling factors result in abnormal formation of metallotect convergence coinciding with, or as a result of, the earth's geological evolution (Pei, 1996). Such a concept involves both temporal and spatial dimensions, and takes into consideration the concept of 'evolutionary metallogeny' (Hutchinson, 1992).

Within the concept of metallogenic province, there are metallogenic components at four different levels: (1) metallogenic geological setting, (2) metallotect convergence field, (3) metallogenic phase, (4) structural setting of the deposit(s), which is in itself dependent upon inter-relationships between the "geological setting", "metallotect convergence field", "metallogenic phase" and "ore deposit type".

1.1 The Metallogenic Geological Setting

The geological setting of the metallogenic province represented in the NMNCP can be divided into three sub-provinces on the basis of tectonic setting. These are the northern margin of the North China Precambrian massif, the Paleozoic Xingmong- Jihei (Daxing'anling-Inner Mongolia and Jilin-Leilongjiang) orogenic belt, as well as the cover of North China Platform, and the Mesozoic-Cenozoic marginal-Pacific tectono-magmatic region. Based on their temporal evolution, twelve metallogenic accumulation environments formed within three sub-provinces. These environments are:

1. Archean craton uplift of Yinshan-Yanshan;
2. Archean cratonic uplift of N. Liaoning-South Jilin;
3. Paleoproterozoic rift belt of East Liaoning-South Jilin;
4. Mesoproterozoic rifting trench of Langshan-Zaheertai;
5. Meso-Neoproterozoic aulacogen of Yanliao;
6. Meso-Neoproterozoic island arc of Bai-naimiao;
7. Paleozoic craton basin of North China Platform;
8. Paleozoic episaltic rift of Inner Mongolia-Jilin;
9. Mesozoic tectono-magmatic belt of Yongji-Yanbian;
10. Mesozoic tectono-magmatic belt of South Jilin-East Liaoning;
11. Mesozoic tectono-magmatic belt of the Yinshan-Yanshan;
12. Mesozoic tectono-magmatic belt of the southern part of Daxing'anling.

1.2 Metallotect Convergence Fields

Based on the analyses of the regional metallogenic geological settings and metallogenic accumulation environments, combined with ore-forming factors, it can be concluded that three metallotect convergence fields occur in the NMNCP: Archean and Paleoproterozoic syn-ore shear-deformation, Proterozoic-Paleozoic syn-ore sedimentary metallogeny and Paleozoic-Mesozoic "line, row, cluster" tectonic magmatism (Pei et al., 1997).

1.3 Metallogenic Phases

Studies aimed at characterization of metallogenic phases are mainly concerned with identifying the physical-chemical conditions of formation for each metallogenic phases, coupled with determination of the metallogenic geological setting and the metallogenic convergence field. This would suggest that there is a condition during the evolutionary process of metallogeny, which produces the physical-chemical parameter of the balance phases of metal illuviation.

1.4 Structure and Fabric of Ore Deposits

Based on the study of the metallogenic geological setting, the metallotect convergence field and character of metallogenic phases, studies of the structure and fabric of ore deposits are mainly concerned with the metallogenic texture and the spatial disposition of known, i.e. discovered, ore deposits, including the prevailing mineral assemblage, mineral association, the alteration zone, variation of the textural, structural and morphological features of the ore deposits in the vertical and lateral directions and recognition of ore-forming stages within the deposits. Combined, these components allow a unique descriptive and genetic model of ore formation for each given deposit.
2.1. Metallogenic Age and Evolution of the Ore Deposits

Based on the intensity of the regional mineralization and the metallogenic evolutionary system, combined with the isotopic age data for the ore deposits, a geochronology study of ore formation and systematic analysis of ore-forming processes may include the following important components. These are the preparation of ground metallogeny (Tp), the initial metallogeny (Ti), the top metallogeny (Tt), the end metallogeny (Te), the hysteresis metallogeny (Th), and metallogenic temporal span (Ts). These components can be compiled into a metallogenic epoch table that can be used to further understand the “rules” defining the metallogenic evolutionary rules of contained ore deposits. An example of metallogenic ages coupled with metallogenic evolutionary characteristics is shown in Table 1 for the Jinchangyu and the Yu’erya gold deposit.

<table>
<thead>
<tr>
<th>Ore deposit</th>
<th>Gold concentration (ppb)</th>
<th>Metallogenic evolutionary system</th>
<th>Isotopic age (Ma)</th>
<th>Metallogenic period</th>
<th>Temporal span (Ma)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jinchangyu gold deposit</td>
<td>4510 - 14780</td>
<td>gold deposit</td>
<td>133 - 97.2</td>
<td>Te</td>
<td>99.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>170 - 133</td>
<td>Ti</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>197 - 170</td>
<td>Ti</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.7</td>
<td>Qingshankou granite</td>
<td>221 - 186</td>
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<tr>
<td></td>
<td>748.3</td>
<td>tectonic schist zone</td>
<td>197</td>
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<td></td>
<td>Minor</td>
<td>ductile-brittle shear deformation</td>
<td>506</td>
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<tr>
<td></td>
<td>Minor</td>
<td>ductile shear deformation</td>
<td>2500 - 1800</td>
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<td></td>
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<tr>
<td></td>
<td>31.0 - 51.9</td>
<td>Archean gold-bearing formation</td>
<td>2950 - 2448</td>
<td></td>
<td></td>
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<tr>
<td>Yu’erya gold deposit</td>
<td>21100 - 281200</td>
<td>gold deposit</td>
<td>176.8 - 163.8</td>
<td>Te</td>
<td>36.4</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>189 - 176.8</td>
<td>Tt</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>200.2 - 189</td>
<td>Ti</td>
<td></td>
</tr>
<tr>
<td></td>
<td>70.1</td>
<td>Yu’erya granite</td>
<td>234 - 175.4</td>
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<tr>
<td></td>
<td>Minor</td>
<td>ductile-brittle deformation</td>
<td>250 - 205</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>3.8 - 35.1</td>
<td>Meso-Neo-Proterozoic carbonate and clastic rock</td>
<td>1800 - 600</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>31.0 - 51.9</td>
<td>Archean gold-bearing formation</td>
<td>2950 - 2448</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.2 Evolutionary Model of Metallogenic Age

The new concept of “evolutionary metallogeny” is used to construct models of temporal evolution. Based on the regularity of the temporal and spatial metallogenic distribution, the physical dimensions of a metallogenic province, combined with approximately 100 ore deposit ages, an evolutionary model of metallogenic ages of ore deposits of the NMNCP is developed (Table 2).

SUMMARY

(1) The metallogenic geological “setting”, the metallocotect convergence “field” the metallogenic “phase” and the structural-morphological fabric of a deposit, are four essential components required to develop a systematic hierarchy when evaluating the metallogeny of a given metallogenic province. An optimum coupling of these components through geological time is required to form the large and super-large mineral deposits in any given metallogenic province.

(2) All mineral deposits must experience processes Tp, Ti, Tt and Te. At times, a coupling of Th with Ts can be used to estimate the scale of metal accumulation/ concentration in mineral deposits.

(3) Establishing the metallogenic age province or district and the construction of an evolutionary model of metallogenic age(s), including the age index (Ai) is a key method and a developing trend that can assist with research to “evolutionary metallogeny” and metallogenic chronology. The method can also be applied when assessing the mineral potential of a specific metallogenic province.

REFERENCES


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Editors note: Contributed manuscript - content does not necessarily reflect the views of the newsletter editor or of IAGOD.
Report of the Working Group on Ores and Metamorphism (WGOM) for 2002

During 2002, WGOM contributed to a session at the IAGOD-Geocongress in Windhoek.

The Newsletter remains the main vehicle of communication with members of the Working Group and the 14-page Newsletter no. 11 was sent out in January 2002. Adrienne Larocque has taken over as secretary of WGOM, in place of Nigel Cook, and will edit the next newsletter in 2003.

Executive Committee
Chair  P. G. Spry, Ames, U.S.A. (first appointed 1999) e-mail: pgspry@iastate.edu
Co-Chair A. Mookherjee, Calcutta, India (first appointed 1999)
Co-Chair W. Prochaska, Leoben (first appointed 1994) e-mail: prochaska@grz08u.unileoben.ac.at
Secretary Adrienne Larocque, Manitoba, Canada / Manilla, Phillipines jstimac@i-manila.com.ph (first appointed 2002)

The Mineral Deposit Studies Group

MDSG is an affiliate of the Geological Society (London) and the Applied Mineralogy Group of the Mineralogical Society. Visit the webpage at http://mdsg.org.uk/ The website together with the MDSG listserver http://www.jiscmail.ac.uk/cgi-bin/wa.exe?SUBED1=geo-mineralisation&A=1 aims to provide economic geologists (academics and industry) with up to date information concerning research initiatives, published abstracts, conference dates and pointers to contents pages of relevant journals.

Geo-mineralisation is the MDSG’s listserver http://www.jiscmail.ac.uk/cgi-bin/wa.exe?SUBED1=geo-mineralisation&A=1 that provides an email discussion forum for academia, students and industry professionals interested in mineral deposits.

MEETINGS CALENDAR

2003

16-22 August Oslo, Norway SCANDIUM 2003: An International Symposium on the Mineralogy and Geochemistry of Scandium. Website: www.nhm.uio.no/geomus/scsymp/


7th-12th September 2003, Kurashiki, Japan: 13th V.M. Goldschmidt Conference. Website:
http://www.ics-inc.co.jp/gold2003


2004


19- 24th September 2004, 8th International Congress on Applied Mineralogy, Aguas de Lindoia, Brazil. Website: http://www.appliedmineralogy.org/_private/Icam04.htm

Global Tectonics and Metallogeny

A bulletin published by the Laboratory of Global Tectonics and Metallogeny, Washington, D.C. in cooperation with the Commission on Tectonics of Ore Deposits (CTOD) of the International Association on the Genesis of Ore Deposits (IAGOD)

Editor: Jan KUTINA, The American University, Washington, D.C. 200016, U.S.A.

Global Tectonics and Metallogeny provides a forum for a systematic discussion of selected questions, focusing on factors controlling the genesis and distribution of ore deposits on different scales. Special attention will be paid to the relationships between metallogenesis and global tectonics.

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Report of the Chinese IAGOD National Group for 2002

Scientific activity

The Chinese National Group of IAGOD had held a meeting jointly with The 7th National Meeting of Mineral Deposits in Xi’an city of Shanxi province on 16-19/9/2002. 30 members of our Group participated into this meeting. This meeting discussed 11 topics and published a special issue of 1249 pages which include regional mineral deposits, typical mineral deposits, noon ferrous metal deposits, noble metal deposits, rare and rare earth metal, noon metal deposits, fluid metallogeny and exploration for deposits.

New secretary

Professor Dr. Mei Yanxiong has been voted as the new secretary of Chinese National group of IAGOD who was graduated Wuhan Geological University in 1982 and engaged in metal metallogeny for many years in Institute of Mineral Resources, CAGS.
Report of the Russian IAGOD National Group for 2002
(including the early part of 2003)

Recent scientific meetings organized by the members of Russian IAGOD group:

1. Symposium “Geology, Genesis and Problems of Developing the Complex Deposits of Noble Metals” attended by 150 scientists from Russia and CIS countries, was held on November 20-22, 2002 in Moscow (IGEM RAS). The meeting was dedicated to 70th Anniversary of M.V. Lomonosov Institute of Geochemistry, Mineralogy and Crystallography - the predecessor of the present Institute of Geology of Ore Deposits, Petrography, Mineralogy and Geochemistry (IGEM RAS). IAGOD members were a major part of Organizing committee (V.V. Distler, V.I. Velichkin, V.A. Kovalenker, V.A. Koroteyev, I.F. Migachev, D.V. Rundqvist, Yu. G. Safonov). Topics of scientific sessions of the Symposium were as follows: (1) Mechanisms and formation environments of complex deposits of noble metals; (2) New types and ore districts of such deposits; (3) Problems of mineralogy of such deposits; (4) New ideas on developing such deposits. A total of 54 oral and 24 poster presentations were given. Some contributions of the symposium will be published in the journal “Geology of Ore Deposits”. A round table discussion was held during the Symposium on the topic of “Complex deposits of noble metals: from geology to processing”. A large volume of extended and rather informative abstracts was issued (in Russian) before the symposium. Contact person for inquiries: Dr. Alexander V. Volkov, (alexandr@igem.ru).

2. VI International Conference “New Ideas in Earth’ Sciences” took place on April 8-22, 2003 in Moscow, hosted by Moscow State Geological-Prospecting University (former MGRI). Some sessions of IAGOD members interest are: (1) Fluids in the Earth Crust and Mantle (organized by IAGOD WG on “Thermodynamics of Natural Ore-Forming Fluids”, Prof. N.N. Akinfiev, Chairman); (2) Formation Environments of Deficient Commodities (Uranium, Gold, Platinum, Diamonds); (3) Advanced Techniques of Mineral Commodities Prospecting, Exploration and Exploitation; (4) New techniques for recovery of valuable components from ores; (5) Main Problems of Geology and Mineralization of the World Ocean, Arctic and Antarctic Regions.

3. A National Russian Conference "Mineral raw material Resources of Russian territory and its continental shelf under conditions of world economics globalization" was held in Moscow in February 2002. The conference was attended by 950 representatives of academic and applied industrial institutes, universities, federal and regional administration, public organizations and mass media. About 20 plenary lectures were delivered and discussed by 80 speakers. The lectures were dedicated to the following problems: a basis of sustainable development of mineral raw material resources in light of globalization processes; problems and prospects of national subsurface usage system; problems of liquidity of previously found mineral raw material resources; the factors determining investment appeal of subsurface usage fund; progressive technologies of reproduction of subsurface usage fund and mineral raw material resources; personnel-related, scientific and technical potential of National Geological Survey - state and prospects.

New Russian Books:

TSNIGRI Publications:

A. TSNIGRI (Russian Central Scientific Geological Prospecting Institute on Deposits of Non-ferrous and Noble Metals, Moscow) published, in 2002, a series of Methodical Instructions on estimates of probable resources of diamonds, noble and non-ferrous metals, with the active participation of IAGOD members. The series includes the following volumes:

(1) V.I.Vaganov, Yu.K. Golubev & V.E. Minorin: Diamonds. 76 pp., 19 figs.
(2) A.I. Krivtsov, I.F. Migachev, R.N. Volodin, A.G. Volchkov, V.S. Zvezdov, O.V. Minina & Yu.V. Nikeshin:
Copper. 212 pp., 57 figs.
(3) G.V. Ruchkin, V.D. Konkin, A.I. Donets, I.A. Avgustinichik & N.G. Kudryavtseva: Lead and Zinc. 169 pp., 44 figs.
(4) V.I. Kochnev-Pervukhov, A.I. Krivtsov, I.A. Avgustinichik & E.S. Zaskind: Nickel and Cobalt. 54 pp., 57 figs., 9 tables.

The principles of estimating probable resources are characterized and the analysis of existing system of their revealing, account and geological-economic estimation is given in the books of this series for each of relevant commodities. The methodical fundamentals and techniques of revealing the promising areas and estimating probable resources are reviewed, the classifications of main types of deposits are given and their role in the global raw material source (RMS) is shown. The integral characterization of the global RMS and also major features of series of the foreign mining projects are given that can be used for estimating the importance of evaluation objects and definition of their geological-economic values. The geological-industrial quantitative models of deposits are described, whose features can be used for grading of the objects. The description of forecasting-prospecting models of objects, for which the probable resources are being estimated (metallogenic provinces and zones, mining regions, ore fields and promising areas) and their major features allowing one to localize and contour the promising areas are given; the optimized package of methods, for the solution of forecasting-prospecting problems which can be used for defining the metallogenic taxons and estimates of probable resources, is offered.

B. TSNIGRI issued also a series of monographs "The Models of diamond, noble and non-ferrous metal deposits" during 2000-2003:


The predictive prospecting models, parametric and geological-genetic models based on ordering of information for the most investigated deposits of Russia and other countries are developed and described for gold-silver deposits of volcano-plutonic belts. The complex description of various models with the use of quantitative methods is given. The geological-genetic classification of gold-silver deposits is offered taking into consideration specific features of respective ore-forming systems and processes. A complex model of gold-silver ore-forming system was developed on the base of descriptions of modern geothermal systems and processes and isotope-geochemical data for ores and deposits. The book is intended for a wide range of geologists dealing with metallogeny, geology, ore forecast and prospecting, and also for professors and students of geology and mining.


The models of porphyry-copper deposits - predictive-prospecting ones, geological-industrial (statistical), parametric, morphometric and gradient-vector models based on ordering of the extensive information on Russian and foreign objects are described. The distribution regularities of porphyry-copper deposits, their typification and spatial-temporal relationships with the consanguineous deposits related to the same ore-magmatic systems are considered. The history of constructing geological-genetic models for the porphyry-copper ore-magmatic systems, the nature and formation environments of ore stockworks and ore-metasomatic zoning, physicochemical and thermodynamic parameters of ore formation are analyzed. The quantitative models of hydrothermal convectively - recycling ore-forming systems based on the gradient-vector analysis of their geometry and structure, hydrodynamic features and calculations of heat-mass transfer with the use of computer simulation are developed. The monograph is intended for a wide range of specialists in the field of metallogeny, geology, ore forecast and prospecting, and also for professors and students of geology and mining.

(3) A.I. Krivtsov, V.I. Kochnev-Pervukhov, O.M. Konkina, V.K. Stepanov & E.S. Zaskind: Cu-Ni-PGM Deposits of Norilsk type. 180 pp. 69 figs., 17 tables, 130 references.

A systematic description of Norilsk economic region (NER) is given. With the use of maps of deep structure and deep seismic sounding data, the differences of the NER area from other parts of trapp field of Siberia were revealed, the results of geophysical investigations with the estimation of features and shapes of reflection from volcano-tectonic depressions are summarized, the main differences of ore-productive and barren intrusives are shown. The regularities of ore distribution in Talnakh intrusive were revealed on the base of statistical treatment of representative bulk of sampling data, the direct ore segregations location dependence on the thickness of the
intrusive is shown. The description of morphology and structure of ore bodies was carried out with the use of statistical and gradient-vector methods. It is shown that vertical and horizontal ore zoning are combined in ore bodies and the distribution of nickel, copper and PGM in ores of various types is analyzed. The information of descriptive parts of the book is synthesized as predictive prospecting models of various metallogenic taxons - from metallogenic zone up to an ore body. The book is intended for a wide range of the geologists specializing in the field of investigation and prospecting of ore deposits, professors and students of geology and mining.

(4) V.I. Vaganov, A.G. Volechov, V.I. Kochnev-Pervukhov, A.I. Krivtsov, V.V. Kuznetsov, I.F. Migachev, V.P. Novikov and G.V. Ruchkin: Spatial metallogenic taxons. The manual. 82 pp., 15 figs., 20 tables.

The manual contains the systematized characterizations of spatial metallogenic taxons of different rank, which are controlling the distribution of deposits of diamonds, noble and non-ferrous metals. The descriptions of the taxons have the predictive prospecting essence and purpose; they are based on ore-formation classification of the relevant deposits. Each of deposit types is represented in the paper by predictive prospecting models, which are interrelated to the characterizations of metallogenic taxons according to a principle of successive approximations. The book is intended for a wide circle of the specialists in the field of the forecasting and prospecting for deposits of diamonds, noble and non-ferrous metals; it can be used in the scientific - applied purposes, when creating specialized predictive metallogenic maps, and also for teaching in mining and geological departments of universities.


The pictorial features and brief textual descriptions of 16 Russian and foreign gold deposits are given which are located in various geotectonic environments - Precambrian greenstone belts, ancient rifts-related troughs, volcano-plutonic belts, zones of tectonic-magmatic activation of median massifs, mobile belts with terrigenous-carbonate and volcanogenic-carbonate filling. The locations of deposits, ore-controlling structures, morphology and structure of ore bodies, gold distribution in them, structural features of ores are characterized. The criteria of the forecasting and prospecting for gold deposits in various geotectonic environments are formulated. The book can be used at forecasting-metallogenic and predictive-prospecting works taking into consideration a style of geotectonic environments of potentially gold-bearing territories. The atlas is also intended for a wide circle of professors, undergraduate and PhD students.


On the basis of retrospective analysis of features of global mineral-raw material resources (MRMR) of noble and non-ferrous metals - gold, silver, PGM, copper, lead, zinc and nickel - the major tendencies of their development and use by comparison of reserves state, mines production, consumption and price situations. The influence of market condition on global MRMR, on leading producer countries and consumers considered. The special attention is given to estimation of potential of development of the world MRMR. The long-term tendencies of shaping and use of noble and non-ferrous metals MRMR shown in 1970-2000, and the directions of investment streams were used for the forecast till 2025 in view of the data on the designs of new mines. These materials form the basis for an estimate of scales of the future world mineral raw material supply and investment appeal of national deposits and MRMR of Russia as a whole. The forecast of development of world and domestic MRMR is given taking into consideration possible growth rates of fuel and energy supply. Materials of the review makes factual basis for developing domestic mineral raw material strategy and target raw-material programs of geological-exploration works. They are of interest for a wide range of the specialists of mineral raw material sector of economics.

Abstracts of recent Russian papers:


The conditions of Pt, Pd, Rh, Os, Ir concentration in metasomatites and in disseminated, stockwork, and quartz-veined gold ores within fold belts of Siberia and Kazakhstan are considered. On the basis of inversive volt-amperometric tests for platinum group elements (PGE), the commercial contents of platinum metals have been discovered in a large number of gold-ore fields from Riphean-Paleozoic orogenic-taphrogenic structures. PGE minerals are represented by native metals, Pt-Pd-Rh-Os-Ir-Au-Ni alloys, rarely by PtS, PtAs; and the tellurides of Pt, Pd, Ag, Au, Cu in association with native Cu, Pb, Ag, Au, Ni, Sn, sulfides, tellurides of Cu, Pb, Bi, Ag, Au are found in ultraheavy fraction of sieve class -0.1 mm. All studied objects were divided into five groups by geological
conditions of setting: gold-platinoid-sulfide-skarn objects in taphrogenic structures of initial taphrogenesis of terrigenous, ophiolitic and volcanic belts; gold-platinoid-sulfide-beresite objects in terrigenous synclines of taphrogenic-compensation type; complex gold-platinoid-sulfide-telluride-argillizite objects in zones of tectonic-magmatic activation; potential gold-platinoid-copper-porphyry objects in copper sandstones and shales. New forecasting criteria for unconventional combined mineralization in various structures of the Earth's crust developed on the basis of the suggested mantle-crustal model of such complex ore formation are presented in the book. These possible complex unconventional deposits will make a considerable contribution to noble metal industry of the next century. The monograph is of interest for specialists in forecasting and prospecting mineral deposits and for students from geological departments.


Geological evolution of Altay-Sayan segment of the earth’s crust since Devenian period mainly depends of tectonic regime of riftogenic type. Intercontinental riftogenesis is accompanied by effusive and intrusive magmatism. The most intensive volcanism followed by formation of a whole complex of effusive facies took place in Middle Paleozoic and Cenozoic.

Volcanism of Devonian “dispersed” paleorift is fixed everywhere in a form of erosion-tectonic outline. By chemical composition there volcanites are alkaline-basic and alkaline-salic. They and co-magmatic intrusive formations are characterized by increased concentrations of rare radioactive and noble elements (Korobeinikov et.al., 1983; Rikhvanov et.al., 1991; Sazonov et.al., 1998). Comparative analysis of geological and petrochemical peculiarities of the alkaline-olivine-basaltic occurrences formed during Devonian and Cenozoic riftogenesis of Altay-Sayan region demonstrates their uniform riftogenic character and common source of non-coherent elements that might be derived from metasomatically altered mantle substance.

Intrusive magmatism within riftogenesis zones of Altay-Sayan region is also variable and specific. It is presented by a large number of stocks, necks, sills, dikes, and diatremes related to Late Paleozoic-Early Mesozoic and Late Mesozoic.

Ore-bearing hydrothermal fluids can appear under conditions of long existence of mantle fluid-magmatic system and its active interaction with water-carbonic dioxide fluids resulting in generation of high potassium carbonatite melts, whose products are fixed within Kuznetsk-Minusinsk of Altay-Sayan region.


The study of vertically extended ore-magmatic systems makes it possible to trace the spatial differentiation of ore components in an ascending fluid flow and specific features of their distribution within different erosion profiles of the system. In the Tominsk-Michurinsk ore cluster, which is located 25 km southwest of Chelyabinsk in the southern Urals and characterized by a tectonic block structure, the present-day erosion profile reveals two sections of the porphyry gold-copper system. Meso- and hypabyssal porphyry copper deposits (Tominsk and others) are located in a tectonic block of Lower Ordovician basaltic rocks in the basement. The subvolcanic mineralization is confined to the Michurinsk tectonic block of Upper Devonian-Lower Carboniferous volcanosedimentary rocks. Its southern sector incorporates the Bereznyakovsk porphyry gold deposit, whereas the northern sector includes large bodies of massive sphalerite-pyrite ores in marbles and small chalcopyrite-barite-quartz lodes in phanites (Biksizak ore occurrence). All ore deposits are located in or assigned to small intrusions of quartz diorites and quartz diorite porphyries.

Like the Au content, Pt and Pd contents are also highly variable in altered granitoids of the Tominsk and Michurinsk zones beyond orebodies. The Pt content of <1 mg/t obviously matches the primary Clarke value in rocks. At the same time, the content of this metal varies from 5 to 48 mg/t in several samples, probably due to its input during the volumetric (?) metasomatism. The Pt content is as high as 70 mg/t in sulfide-rich sectors of the Tominsk deposit. The situation is somewhat different in the Michurinsk zone. The maximal Pt content reaches 500 mg/t in sulfide-rich sectors of the Bereznyakovsk deposit, and contents on the order of 120-500 mg/t are not rare. The content ranges from 61 to 170 mg/t in massive sulfide ores of the Biksizak ore occurrence. However, the maximal Pt content (2.4 g/t) is registered here in phanite-hosted chalcopyrite-barite ores. Thus, histograms of Pt distribution clearly demonstrate that its concentration is higher at the subvolcanic level of ore zones relative to meso- and hypabyssal ones.
The Pd content is higher than the Pt content in altered granitoids. In the Tominsk Massif, the Pd content varies from 5 to 63 mg/t, and samples with contents of 5-18 and 25-63 mg/t are approximately equal in number. In contrast, the Bereznyakovsk Massif contains 7 to 210 mg/t of Pd (generally 24-60 and 110-210 mg/t). Relative to metasomatically altered granitoids, sulfide-rich sectors of the Tominsk Massif are slightly enriched in Pd (up to 100-140 mg/t). At the Bereznyakovsk deposit and Biksizak ore occurrence, this pattern is not observed, although the number of samples with a higher Pd content (210-250 mg/t) is greater. Thus, the Pd concentration is higher in the subvolcanic level relative to meso- and hypabyssal levels in both altered granitids and ore zones.


Non-traditional gold-platinoid deposits of magmatogenic-hydrothermal and sedimentary-hydrothermal types are often found in fold zones of Russian and foreign territories. They belong to gold-platinoid-skar, gold-platinoid-quartz-beresite, gold-platihoid-carbon-sulfide-listvenite, gold-platinoid-sulfide-argillite, copper-sulfide-gold-platinoid-porphyry, and gold-platinoid groups of ores in copper sandstone and shale. Such non-traditional complex ore objects were formed in orogenic and incomplete or complete riftogenic structures and during tectonic-magmatic activation in regions of active development of mantle-core paleodiapirism and metasomatism. Ore-bearing geological formations often accompany intrageosynclinal uplifts, zones of deep-seated faults, horst-graben structures, and riftogenic depressions in zones of active hydration of rocks under the action of hydrothermal metasomatism. Ore-metasomatic zonal structure is often observed in ore fields and deposits: quartz-albite-orthoclase metasomatites with Os, Ir, Pt, Mo, and W at the bottom of columns, beresite-listvenites with Au, Pt, Pd, Bi, and W at their central part, and listvenites and argillites with Te, Pd, Au, Ag, and Sb above. Additions to and redistribution of ore are observed in metasomatized zones. The vertical extent of some ore-metasomatic columns is as great as 1.2-3.8 km.


Geological, mineralogical and geochemical characteristics of zircon-ilmenite deposits located within Western Siberia are considered, and accumulation levels of rare, rare-earth and radioactive elements in these deposits are characterized. It has been noted that there are commercial concentrations of these elements in the collective concentrate of heavy fraction. This type of deposits should be considered as complex one with titanium and zirconium.

The book presents data on the fine-grained sands up to the stage of heavy fraction collective concentrate production and further hydrometallurgical processing resulting in obtaining products or semi-products. Economic significance and importance of such deposit, especially, for Western Siberia is demonstrated, and economic efficiency of traditional processing techniques is compared with modern ones. Recommendations on exploration of such deposits are given. The book will be interesting for specialists in geology, mineralogy and geochemistry of placer deposits, in ore-dressing and hydrometallurgy, businessmen, economists, political and economical leaders of the regions, for mining companies, students and post-graduates.


Results of the author's investigations in coal deposit geochemistry are presented in the book. Problems concerning geochemistry of rare-earth, radioactive, noble and some rare (Rb, Cs, Hf, Ta, Sc) elements in coals have been considered. Abundance ratios of these elements in coals all over the world have been estimated. Accumulation levels of the rare elements for Kuznetsk coal-bearing basin have been determined, vertical and lateral variation of their distribution has been studied. Reasons for increased accumulation of the elements within distinct coal seams and deposits have been discussed. The authors have drawn inferences about rare elements occurrences in coals. The book may be useful for the students, post-graduates, geologists, ecologists, technologists and specialists interested in geochemistry of coal and problems concerning coal deposit complex development.
Information on the Geological Analytic Center «GOLD-PLATINUM», Tomsk, Siberia, Russia.
Prof. Alexander F. Korobeinikov, Director; tel/fax: 3822 415 733, tel: 3822 426 513, E-mail: lev@tpu.ru

The Geological Analytic Center "Gold-Platinum" performs its research activities in the following areas:
* Development of scientific fundamentals for formation, distribution, forecasting, and prospecting of gold-bearing deposits and non-traditional gold-platinum-rare metal deposits.
* Exploration of gold-and-platinum black-shale formations and studies of conditions for forming large and unique complex deposits.
* Development of formation models for complex deposits and new benchmark forecast methods and search for hidden complex ore of commercial grade.
* Development of new methods of inversion voltamperometric X-ray-fluorescent natural substance analysis to identify noble and rare metals.
* Creation of automated micro-processing voltamperometric analyzers.
* Preparation of high-level specialists: Masters, PhDs, and D.Sc.

In 2001, the Center has defined regularities of formation and location of non-traditional gold, platinum and rare metal deposits in various structures of Siberia; updated rational chemical methods of preparation and analysis of geochemical samples for definite ore types to provide a high-frequency determination of Pt, Pd, Au, RE and REE from 1-10g shots by inversion-voltamperometric and X-ray-fluorescent methods. The Center continued investigations on geochemical composition of ores and distribution of Au, Ag, Pt, Pd, Rh and RE in ores and minerals of Gorny Altai. For rare metalliferous veins and gold-and-copper fields we have developed ore and geochemical formation models. Gold, platinum and rare metal deposits have been classified.

New forecasting criteria and attributes of non-traditional gold-platinum and rare metal mineralization have been developed. The conducted research has contributed much to the solving of foremost problems of ore geology and geochemistry of noble and rare metal complex deposits. Research was conducted in economic terms together with the natural resources Committee of Krasnoyarsk and Altai Territories and was supported by the Russian Basic Research Foundation grant N 99005064718 "Formation and allocation of complex gold and rare metal deposits in Siberian structures".

In 2001, our faculty staff organised two international conferences:
1. Problems of Geology and Depth Mastering:
   - International Symposium of students, postgraduates and young researchers, Tomsk, TPU.
2. International Scientific Conference on Mining and Geological Education in Russia. 100- year Service for Science and Industry, Tomsk, TPU.

The Center took part in 4th International and All-Russia Innovation Forum Integration-2001, Tomsk, Technopark, 28-30.11.2001, Four monographs by Prof. Korobeinikov and Prof. Boyarko were presented. The group of our scientists, such as A. Korobeinikov, N. Kolpakova, V. Voroshilov, A. Pshenichkin, Y. Ananiev, Y. Zykov, S. Mikhailova are winners of Tomsk Region Prize in the field of education and research.

The original educational programs have been elaborated and are being delivered for geological students of TPU:
1. Forecast and prospecting for noble metals' fields.
2. Special geological mapping of ore deposits.

In 2001, we have published one monograph and 19 scientific papers on subjects of the "Gold-Platinum" Center.


The monograph summarizes long-term experience of geochemical investigations on the continental shelf of Russia and adjacent territories and outlines criteria of geochemical prospecting for solid mineral resources (SMR). The
first part of the book examines general regularities of chemical elements distribution in bottom sediments of the standard inshore and offshore environments and typical indicator associations of elements. Unique features of the near-surface layer of bottom sediments as a strong complex geochemical barrier are discussed, with special reference to its ability to accumulate information about underlying buried geological bodies. Levels of heterogeneity within geochemical fields of bottom sediments are distinguished and interpreted in terms of their genesis. In the second part of the book the geochemical criteria for prospecting of the main types of shelf SMR (placers, manganese nodules, metal-bearing sediments, etc.) are discussed; attention is focused on submarine placer deposits as one of most important among solid mineral resources on the shelf. Geological-geochemical models for the main economic types of submarine SMR deposits are given.

The book is intended for the broad circle of marine geologists and prospectors involved in geochemical prospecting and exploration for mineral deposits. (62 Tables, 115 Figures, 327 References).


The data on 313 massive sulfide objects (ore districts, orefields and deposits) that belong to Cyprus, Urals, Kuroko and Filizchay ore types, have ages from Late Archean to present time and located on all continents and in some structures of the world ocean were analyzed. The generalized information is related to features of copper, zinc and lead distribution in objects of these ore types among particular temporal groups and metallogenic regions. The total resources of massive sulfide ores (10.7 bill. t.) and contained in them copper (121.2 Mt.), zinc (326.6 Mt.) and lead (144 Mt.), formed during all geological history of the Earth were calculated, including their distribution among ore types and periods of formation. Their model parameters were determined. It is shown that the overwhelming majority of massive sulfide objects (81.8 %), reserves of ore (90.8 %), copper (85.6 %), zinc (92.3 %), lead (95.2 %) and total metals (91.7 %) were formed prior to Mesozoic, i.e. in time when Pangea existed. That means that we should be careful in direct comparisons of relatively young geodynamic conditions of massive sulfide mineralization to those of Paleozoic and the more so of Precambrian time. V.I. Smirnov’s idea about conservatism of massive sulfide mineralization metallogeny in geological history of the Earth was confirmed.


Under Cis-Urals sedimentary basin, a large area of sedimentary rocks of a wide age span - from early Riphean up to late Permian inclusive is understood. It belongs to east margin of the East-European platform. This platform belong to Laurasian group of old platforms which comprises also the North-American, Siberian and Chinese platforms and is quite similar to them all in structural features and sedimentary formations of their mantles. The structure of sedimentary mantle of the Cis-Urals sedimentary basin is characterized. The distribution features of deposits and ore showings of manganese, stratiform lead-zinc, copper sandstone, barite, phosphorite and fluor spar mineralization in this mantle is considered. Their close relationship with the aconservation zones* of Timan-Pechora and Volga-Urals oil-gas provinces and their structural and stratigraphic conjugation with oil-gas producing sedimentary units and evaporite formations is substantiated (*aconservation zones is fuel geology term referring to badly screened peripheral zones of oil-gas basins where hot metalliferous brines are discharged).


New types of PGM mineralization and description of all objects, including known ore types are presented for the first time for the region. The state of the world PGM market and a role played by the Urals in it, a dynamics of PGM production and resources is considered. Data on extent of investigation of PGM mineralization in the Urals and geological-industrial types of PGM mineralization, including promising ones. Industrial importance of elsewhere unknown Au-Pt-Pd mineralization of so-called “baron” type is shown: a new for the Urals type of Au-PGM mineralization in carbonaceous sediments and also in supra-ophiolite black-shale units is described; a new interpretation of formation and geological-industrial value of PGM ores and PGM-bearing ores of Nizhny-Tagil (Solovyovogorsky) and Volkov types is proposed.

Numerous, so far unpublished data on geology and mineralogy of beryl-columbite granite pegmatites related to a large Late-Paleozoic collisional Adouy adamellite-granite massif which composes the upper part of Murzinsky-Adouy Pre-Paleozoic microcontinent within the Urals fold belt, is offered. Pegmatite bodies of economic importance form 11 series of numerous closely-spaced veins in the eastern and south exocontacts of the massif. Extent of bodies differentiation, metasomatic alterations and mineral value of the pegmatites is increasing with the distance from the massif. Characteristic (typomorphic) minerals of the pegmatites are: columbite, tantalite, pyrochlore, microite, samarskite, fergusonite, euxenite, beryl, garnet, apatite, gahnite, cyrtilite, monazite, xenotime, fluorite, molybdenite, tourmaline, muassonite, lepidolite, ilmenite, rutile. Pegmatites for a long time were mined with the production of concentrates of tantalum-columbite, beryl, feldspar, muscovite. The detailed description of previously exploited pegmatite deposits is presented along with numerous analyses of minerals from pegmatites (tantalum-niobates, berils, garnets, mica, apatite) and from their weathering crust.


An original classification of hydrothermal gold deposits and new scheme of ore precipitation environment facies for gold deposits is offered in the book. On the example of “gold rodingite ore” holotype - the Zolotaya Gora deposit - is proved that such ore type does not exist at all, as the ore bodies of that and other deposits are represented by listvenitized rodingites among apoperidotitic or apokomatiitic serpentinites. The existence of minerals of cuprous gold group; native copper, antimony and lead; Au-Ag amalgams; antimonides of Ni, Cu and Fe in these gold ores is a result of these ores formation under conditions of extremely low sulfur fugacity provided by their isolation from “sulfuric wind” of surrounding ultrabasic massifs and pyrite-bearing volcanics, suffering metamorphic transformation simultaneously with the former, as well as from pyrite-bearing sedimentary units, by a thick cover of serpentinites nearly impermeable for fluids. ISBN 5-89176-169-6.


A model of vertical zoning of Central Kolyma gold-quartz deposits is proposed. It comprises near-root, middle and frontal parts differing in a set of features (structural-morphological types of ore bodies, mineral ore composition, wall-rock alterations, Au/Ag ratio, typomorphic features of native gold and silver, homogenization temperatures of fluid inclusions in vein quartz etc.). The deposits typical of frontal (Utinskoye), middle (Natalkinskoye) and near-root (Dorozhnoye) parts of the ore column are described. Information on gold potential, carbonaceous matter distribution in terrigenous units of Verkhoyansky sequence, on composition and gold content of diagenetic sulfides is given. ISBN 5-8044-0216-1.


The fundamentals of ore-formational and ore-facial analysis are considered on the example of massive sulfide deposits of paleooceanic structures of the Urals. The major objects of studies were: copper-pyrite formation of spreading basins (Cyprus type), copper-zinc-pyrite formation of tension island arc structures (Urals type) and gold-pyrite-base metal formation (Kuroko type). A cobalt-copper-pyrite formation of suture zones, that was previously considered as a part of Cyprus type, is treated as independent one and described. The structures and mineralogical composition of the following major ore facies of massive sulfide deposits is analyzed: near-bottom hydrothermal facies, hydrothermal biogenic, clastogenic, exogenous, hydrothermal-metasomatic and facies of regenerated ores. ISBN 5-7691-1234-4.


The features of crystallochemistry (structural crystallography) of main bentonite mineral - montmorillonite - is considered and a classification of raw material is offered. The raw material resource of bentonite in Russia and some other countries exporting bentonite to Russia is considered in detail. Modes of bentonite usage in metallurgy and casting production, in drilling and absorbents industry are also considered in detail. Specific features of usage for different bentonite varieties in various industries and calculated efficiency of its application is analyzed. ISBN 5-89118-183-5.

A.V. Maslov, M.T. Krupenin, E.Z. Gareyev & L.V. Anfimov: *Riphean of western slope of South Urals*

A stratotype site of Riphean, one of the largest stages of development of Earth’s lithosphere and biosphere, is located on the western slopes of South Urals. Formation of platforms mantle on giant epikarelion cratons, which formed a frame of Pangea-1, subsequent destruction of the supercontinent, its subglobal glaciation and development of extensive shallow basins - are all related to this era. Riphean sequences are location sites for the deposits of various metals and industrial raw materials, for instance, large deposits of magnesite (Satka, Iskakay etc.), siderite (Bakal, Akhten etc.), barite and base metals (Kuzhinskoye district of Chelyabinsk region). The 1st (from total 4) volume contains short information on geological structure of the territory, history of lithological and minerogenic investigations of sedimentary sequences of Riphean and Vendian, the geological monuments are characterized and the current concepts of sedimentation, lithogenesis and ore genesis are summarized. A special attention is paid to deposits characterization in sedimentary sequences of Riphean and possible models of their formation and transformation. ISBN 5-94332-012-1.


A short information on major industrial types of mineral commodities deposits of the Urals is given, their location and geological environment, composition of country rocks, shape and size of ore bodies, their mineral and chemical composition, genesis and outlooks of new findings are described. The fundamentals of ore prospecting and exploration are given. A short description of starting practical studies to prepare geological field studies is given. ISBN 5-7851-0375-3.


Massive sulfide deposits (MSD) formation is one of the most ancient ore forming processes of the Earth and accompanies the volcanism during last 3.5 BA. There were at least four relatively short epochs responsible for the formation of major part of ore reserves and overwhelming number of MSD: 2.69 - 2.72 MA, 1.77 - 1.90 MA; and in Phanerozoic, the largest MSD formation peak corresponds to Devonian-Early Carboniferous and, less important, - to Cambrian-Early Ordovician. Recurrent initiation of MSD formation had been cyclic due to general direction of tectonic activity and existence of tectonic cycles, which included rapprochement of continental massifs, formation and subsequent destruction of the continents. During each cycle, the different types of MSD appear in a certain succession, which is a bit different in concrete ore provinces. Intensity of MSD formation was rising in the course of geological history, the deposits distribution was becoming wider, a number of larger deposits grew, the deposits diversity also was increasing; the ore composition spectrum, wall-rock alteration types and related hydrothermal-sedimentary deposits, sulfur isotope composition and many other features were irreversibly changing.

FORTHCOMING MEETINGS IN RUSSIA:

The XI International Fluid Inclusion Research (FIR) Conference

will be held on September 8-12, 2003, by Russian section of COFFI and hosted by Russian National Institute of Mineral Commodities Synthesis (VNIISIMS), Alexandrov city (about 100 km north of Moscow, 2 hours by train or car).

Topics of scientific sessions: (1) Equipment and methods of FIR. (2) Melt inclusions and mineralization in igneous rocks. (3) FIR of formation processes of pegmatites, skarns, greisens and related ore mineralization. (4) FIR of hydrothermal ore-forming systems. (5) FIR during mineral synthesis. (6) History of FIR, methodical instructions for preparation of teaching programs for universities, short courses and creation of technical instruction documents for applied FIR.

Deadlines: for abstracts 01.05.03, for full papers 01.06.03. Conference program will be sent out from 01.07.03. Abstracts can be presented by e-mail or on floppy disk in Word-2000 format (Times New Roman 12, 1.5 spacing, margins - all-round 2 cm, up to 3 pages for abstract and up to 20 p. for paper). Participants will be hosted by “Crystal” pension hotel for ca. US$10 per day (in roubles equiv.), meals included (preliminary estimates).

Registration fee US$30 (15 for undergraduate and PhD students) in roubles for the sending day exchange
rate of the Central Bank of RF (may be paid at the registration desk on arrival). A cultural program is planned. Alexandrov is one of the most ancient cities of Russia - a part of its “Golden Ring”. Several museums can be visited and the Assumption monastery (former residence of Russian tsar Ivan the Terrible).

Contact person: Deputy Director of VNIISIMS E.V. Polyansky: e-mail: pol@vniisims.elcom.ru, Fax: (7-095) 584-5828, Phone: (7-095) 584-5834. Mailing address: Polyansky E.V., VNIISIMS, Institutskaya Str., 1, Alexandrov, Vladimir region, 601650, Russia. Foreign participants may contact Mr/Dr. Ingrid N. Kigai, who can organize meeting visitors in Moscow and help them to change for Alexandrov: Phone (7-095) 230-8401 (off.), (7-095) 455-6287 (home), Fax: (7-095) 230-2179, e-mail: kigai@igem.ru.

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Contributed by I.N. Kigai

Original research paper:

N.S. Gorbachev - Behavior of ore elements during crystallization and emanation differentiation of sulfide magma from geochemical and experimental data.
Institute of Experimental Mineralogy RAS, 142432 Chernogolovka, Moscow region, gor@iem.ac.ru

Crystallization and emanation styles differentiation of sulfide magma was investigated on the example of the October deposit of sulfide ores (Norilsk region). The deposit is related to Kharaelakh branch of Talnakh intrusive located west of Norilsk-Kharaelakh fault in Devonian terrigenous-sulfate-carbonate rocks. This unique deposit is well known for the high content of sulfides whose essential part (up to 50 %) is concentrated in massive ores. Within the limits of the deposit, the massive ores form a series of lenticular segregations; among which the largest (4 km long, 2 km wide at the vertical thickness up to 56 m) is the Main Sulfide Lode (MSL) located in the bottom of the intrusive and in the rocks of its lower endo- and exocontacts. A mineralogical and geochemical zoning was found in this lode. Samples for investigations were selected from the cores of exploration boreholes and underground workings of October, Taymyr and Komsomol mines. The samples were analyzed by Instrumental neutron activation analysis at the University of Toronto, Canada with the precision of 10 rel. %. The contents of elements were recalculated for 100% of sulfides.

Mineralogical zoning is expressed in change of ore mineral assemblages in a sequence (from flanks to center): pyrrhotite (Po) - pyrrhotite-chalcopyrite (Po-Cp) - cubanite (Cb) - chalcopyrite (Cp), mooihoekite (talnakhite) - chalcopyrite (Mh (Tl) -Cp). Transition between them is gradual, through intermediate varieties (subtypes): - Cp-Po, Po-Cp-Cb, Cb-Cp, Cb-Mh (Tl) -Cp. From Po to Cp ores, the content of chalcopyrite and Cu is increasing, that of pyrrhotite, Fe and S decreases. Cb ores are impoverished in pyrrhotite and chalcopyrite. Content of pentlandite and Ni varies in rather narrow limits, with maxima in Po and Cb ores.

In the geochemical respect, the mineralogical zoning of Po⇒Cp ore is expressed in rise of Cu and Cu/Cu+Ni, which vary respectively from 2.5 wt.% and 0.5 in Po and up to 32 wt.% and 0.9 in Cp types of ores. The noble metals relative to distribution in various mineral types of ores can be divided into two groups: those of copper - Pt,
Pd, Au and iron including Ir, Os, Rh and Ru. Similar to Cu, the concentrations of elements of the first group are increased from Po to Cp ores. Positive, close to linear correlation is observed between the contents of these elements and Cu. With the use of copper content and Cu/Cu+Ni ratio in massive ores, it is possible to define an ore type and estimate the Pt, Pd, Au content in them with a sufficient accuracy. The distribution of elements of the second group is more complicated. Their content decreases from Po to copper-rich, Cp types of ores, the second maximum related to Cb ores (Fig. 1) is however observed.

The formation of mineralogical and geochemical zoning is determined by crystallization differentiation of sulfide melt, that was well investigated experimentally, its sequence corresponds to zoning of the MSL. It is possible to explain different behavior of noble metals during crystallization by their relative affinity to the earliest and widespread phase - monosulfide (Mss) and in a lesser extent - to intermediate (Iss) solid solutions. Mss-incompatible elements - Pt, Pd and Au, whose distribution coefficients between Mss and residual sulfide melt D Mss/m are about 0.1-0.3, like Cu, are accumulated during crystallization in sulfide melt. Mss-compatible elements - Ir, and also Os, Rh, Ru, with distribution coefficients D Mss/m = 3-5, are accumulated in Po and also in Cb ores. As it is seen from Au, Pt and Pd distribution in ores, the Iss (Cb and Cp) crystallization does not essentially influence on distribution of these metals. Quite opposite, the existence of second maximum of accumulation of iron group elements - Rh, Ru, Ir and Os in Cb ores impoverished in pyrrhotite and chalcopyrite, evidence to a high affinity of these elements also to another iron-rich phase - Cb Iss.

The distinctions in PGM and Au affinity to Mss and Iss, fixed in distribution of these elements in various ore types, allow one to estimate their relative affinity to Mss and Iss. So for example, a positive correlation of (Au/Au+Pd) to Cu in all ore types and negative one of (Pd/Pd+Pt) to Cu in Po, Po-Cp and Cb ores, suggests a higher affinity to Mss and Cb Iss of Pd in comparison with Au, and Pt - in comparison with Pd. The negative dependence (Ir/Ir+Os) - Cu and (Ru/Ru+Os) -Cu in Po and Po-Cp ores - is indication of higher Ir and Ru affinity to Mss in comparison with Os, and the maxima of their ratios in Cb ores are indications of higher affinity to Cb Iss, (from 2 elements, a residual sulfide melt is enriched during crystallization in more Mss-incompatible element).

Other distribution style of ore elements is observed in a vertical cross-section of the deposit including MSL and disseminated ores of lower horizons of the intrusive located at the MSL upper exocontacts, and also in horizontal cross-section of the MSL. A vertical cross-section of the sulfide lode from its bottom up to its roof, the decrease of Cu, PGM, Au is seen with the subsequent anomalous enrichment in these elements occurring in syngenetic disseminated ores located in the overlying gabbro-dolerites. The following sequence of enrichment degree (k) of the anomalous zone by metals as compared to massive ores can be detected: Ni=Co (k=1) < Cu (k=3-5) < Pd (k=5-10) < Rh (k=10) < Pt (k=10-15) < Ir (k=15-20) < Ru (k=20-30) < Os (k=50-60) < Au (k=100). In a horizontal cross-section of the MSL, the frontal part is also enriched in all ore elements and light sulfur isotope. The sequence of enrichment is well correlated with a relative affinity to sulfur and does not depend on affinity of these elements to Mss (Pd-Rh, Os-Au). All these facts make possible to relate the vertical and horizontal geochemical zoning with the fluidal transport during a degassing of sulfide magma, perhaps with the participation of fluids from a deep-seated source. The degree of abnormal zones enrichment in ore elements reflects differences in their distribution between a fluid and sulfide melt and is controlled by metals affinity to sulfur. (The studies were financed by the RBRF Grant 01-05-96403, 03-05-64531).

**ICAM 2004**

We are glad to announce the Call for Papers for the 8th International Congress on Applied Mineralogy (ICAM 2004) to be held from September 19 to 22, 2004, in Aguas de Lindoia, a small city nearby Sao Paulo, Brazil.

The scientific program covers the following fields:
- advanced materials
- gem materials
- analytical instrumentation
- industrial minerals
- biominerals and biomaterials
- mineral exploration
- ceramic, glasses and cement
• oil reservoirs
• cultural heritage
• ore mineralogy
• environmental mineralogy and health
• process mineralogy

Short courses on related fields, as well as field trips to world-class ore deposits will take place before and after the Congress.

The ICAM 2004 is being organised by the International Council for Applied Mineralogy (ICAM) and by the International Mineralogical Association - Commission on Applied Mineralogy (IMA-CAM).

Deadline for abstracts is 1st October, 2003.

Further information about ICAM 2004 can be found at www.icam2004.org.


Some members of the National Group are participating in GRDF/CRDF Joint Project entitled 'Geology and gold favorability of carbonaceous metasedimentary rock sequences of the Southern Slope Zone, Greater Caucasus, Republic of Georgia'. Project duration: 18 months. Project participants: J.Doebrich, R.J.Goldfarb, M.Kekelia, S.Kekelia, V.Gugushvili, G.Asatiani, O.Enukidze, N.Gagnidze, N.Sadradze, L.Chinchaladze, L.Ivanidze.

The seminar 'Mining Industry of Georgia in a Free Market Environment' was held from January 31 to February 1, 2002 in Tbilisi. It was hosted by the Ministry of Economy with co-directors from the Union 'Georgian Resources and Sustainable Development' and JICA Master Plan Survey Team. During this seminar, the target, role and contribution of the mining industry were discussed between the Georgian government, the embassy of Japan, JICA Team and international and non-governmental organizations.

A detailed review of the mineral resources and mining industry in Georgia is available now at http://www.mineralresources.ge/ The site also features background information about Georgian history and culture, economy and political life. Based on the use of state-of-the-art information technologies, it provides, to all those interested in Georgia’s mining sector, the relevant facts, economic parameters and other data on the country’s major mineral deposits and mining enterprises.

Recent publications:


Announcement

A field Conference on “Magnesite and Talc” is to be organized by Russian section of COIMR (Commission on Industrial Minerals and Rocks of IAGOD) and the Russian Association of Industrial Minerals (V.I. Lukashov - President) in cooperation with IGCP 443 Project (leader - Dr. M. Radvanec, Slovakia) from September 28th to October 7th 2003 in the South and Middle Urals, Russia.

The terms of the field trip are very comfortable (participants themselves should only obtain return air tickets to Ekaterinburg. All local transportation, accommodation and meals will be covered by organizers. Additional information can be obtained by e-mail from Prof. Vassily V. Nasedkin (nasdi@orc.ru).

Information on the IGCP-443 Meeting and Field trip venue:

Some Russian geologists are participants of the IGCP-443 Project on Magnesite and Talc deposits. Within the framework of this project, meetings and field trips to magnesite and talc deposits have been held annually. This year, the field trip and meeting will be held in the Urals. Russian IAGOD national group and COIMR invite all interested people to take part in this meeting and excursions. The following will be visited during the field trip.

1. Outskirts of Ekaterinburg (Uktuss Mountains). Numerous outcrops consist of weathered ultramafic rocks. It is possible to see the section of weathering crust divided into zones. There are bodies of cryptocrystalline magnesite and brown iron ore. Ekaterinburg is the largest cultural and industrial center of Middle Urals. The Institute of Geology and Geochemistry of RAS, the famous teaching Mining Institute and the worldwide known mineralogical museum is located there.

2. The Shabrovskoye deposit is located 20 km west of Ekaterinburg in Sverdlovsk region (the Urals). The region of the deposit consists of metasedimentary rocks (siliceous slate, quartzite, marbled limestone). These rocks have been intruded by bodies of peridotite. Peridotites form 2 bands: southwestern and northeastern. The peridotites of the northeastern band are most metamorphosed and transformed into talc-carbonate rocks. There are 2 open pits: old and new, respectively 70 and 30-40 m deep. The talc-magnesite lenses show a steep dip; they are 1,5-2 km long and about 50-350 m thick. A dressing plant is located near the open pits.

3. Satka deposit is located 350 km south of Ekaterinburg and 100 km west of Miass city. The deposit consists of 20 ore bodies, which occur as beds in dolomites. The largest of them is 8000 m long and 40-80 m thick. The deposit is mined with 3 open pits and one underground mine. There is another explored deposit at the contact of rapakivi granite massif. The geological relationships between rocks are well seen in open pits. There is the largest plant for refractory production, museum and sauna.

4. The Syrostan deposit of soapstone is 250 km south of Ekaterinburg and 20 km west of Miass. The deposit is mined with open pit. There is a crushing plant there. The scientific center of Ural Department of Russian Academy of Sciences is in Miass. A famous protected mineralogical national park is there, near Miass.

5. The Bakal deposit of magnesite-siderite ores was explored as iron ore deposit and magnesite resources were not estimated. The geological relationships between siderites, magnesites and dolomites are seen well in two open pits. Only siderite ore is mined now, although the quality of magnesite is not worse than in Slovakia.

6. The Katav-Ivanovskoye magnesite deposit is located 50 km south of Bakal mine. Magnesite is represented by coarse-crystalline sparry magnesite. There are old abandoned open pits.
7. The Khalilov deposit of cryptocrystalline magnesite is located near railway station Khalilovo, 60 km west of the Orsk city and 500 km south of Miass (South Urals). The deposit is located inside of large serpentinite massive, which is formed as result of peridotite serpentinization. Magnesite-containing serpentines are divided into two flat-lying horizons: upper and lower. It was mined actively before the Second World War. Now it is mined in domestic manner for Orsk metallurgical and chemical plants. The Khalilov magnesite deposit consists of two horizons. The upper horizon is represented by magnesite breccia, which consists of fine angular magnesite fragments with inclusions of serpentine breccia. Serpentine breccia is schistose and has gliding planes. The thickness of the upper horizon is 5-6 m. The lower horizon consists of dark-green serpentinites with chrysotile veinlets. Magnesite occurs here as veins and lenses. The veins are criss-crossing each other to form a stockwork. The magnesite veins are nearly 0.8 - 1.3 m thick. Total explored and estimated reserves are about 4-4.5 mln. t.

Contributed by Prof. V.V. Nasedkin.

Report of the Ukrainian National IAGOD Group for 2002

The National group for Ukraine, which has 30 members, has been reconstituted in 2003, with the following officials elected.

Chairman: Shumlyanskyi Vladyslav O., DSc., prof., Vice-President of the Institute of Fundamental Studies of the Ukrainian Science. Assoc. P.O.Box 291, 01001, Kyiv-01; tel./fax 2356983; mail shum@uprotel.net.ua.

Vice-chairman: Zagnitko Vasyl M., DSc., prof., head of department of the Institute of Geochemistry, Mineralogy and Ore Formation of National Academy of Science of Ukraine: 34, Palladin Prospect, Kyiv-142; tel. 4240405, mail igmof@mail.kar.net. The national group has 30 members,

Secretary: Mykhaylov Volodymyr A., DSc., docent of the Taras Shevchenko Kiev National University: 21, Prospect Pobedy, apt. 115; 03055 Kyiv; tel. (380-44) 2360862, 2597009; wam@naverex.rieu.ua.

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Prykhodko Vasyl L., principal geologist of the State Geological Enterprise “Pivnichgeologiia”: 10, Geophizyk side street, 02088, Kyiv; tel. 5648469; fax. (0482) 5648462.

Shcherbak Dmytro M., DSc., prof., Taras Shevchenko Kiev National University: 16, Obolonksy Prospect, apt. 227, 03205, Kyiv; tel. 2597009, home tel. (380-44) 4198109.

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Shnyukov Evgen F., DSc., prof., member of the Ukrainian Academy of Science, director of the National Natural History Museum: 15, Bogdan Khmelnytskyy street, 01601, Kyiv-30; tel. (380-44) 234-3675, tel./fax. (380-44) 2256266.

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Yatsenko German M., DSc., senior researches, Ivan Franko Lviv National University (Lviv): tel 964431, home tel. 766520, fax (0322) 72-19-81, mail lesya_pavluick@yahoo.com

Yushyn Oleksandr O., PhD., senior researches of the Institute of Geochemistry, Mineralogy and Ore Formation of National Academy of Science of Ukraine: 34, Palladin Prospect, Kyiv-142; tel. 4240405, mail igmof@mail.kar.net.

Conferences during 2002:

Members of the Ukrainian IAGOD National Group took effectively part at the International Symposium “Metallogeny of Precambrian Shields” in Kyiv, September 13-26th 2002 with one field trip before and one field trip after the meeting. A total of 14 oral and poster presentations were given by members of the Ukrainian IAGOD National Group. The principal topics are: 1) Metallogenic zonality of the Precambrian of the Ukrainian Shield (D.S.Gurskiy, V.I.Kalinin, A.S.Voinovskyy, E.O.Kulish, S.V.Nechaev); 2) Magmatism and ore-forming processes of the Ukrainian Shield (K.Y.Esipchuk, I.B.Shcherbakov); 3) Precious metal of the Ukrainian Shield (O.B.Bobrov, D.S.Gurskiy, B.I.Malyuk, S.V.Nechaev, A.O.Sivoronov, O.A.Yushyn) and others. Two special volumes of Mineralogical Journal (Ukraine), volume 24, numbers 2/3 and N 4, contain the papers and posters from the Symposium.

Selected publications:


Some future planned activities of the IAGOD National Group of Ukraine:
1. Creation of the interdepartmental council on ore deposits geology on the Ukrainian State Geological Service.
2. Initial preparation for organization of an international field workshop on Ukrainian ore deposits in 2005.
5. Cooperation with other IAGOD Commissions and Working Groups.
6. Preparation of the proposition on joint projects with INTAS and NATO.
7. Preparation for a new journal “Geochemistry and Ore Formation” to be a journal of the IAGOD National group of Ukraine.
8. New publications (articles, monographs etc.) about ore forming processes, geology and structure of the different ore deposits.
10. Preparation, together with IAGOD, of an English edition of the monograph “Mineral Deposits of Ukraine”.

Contributed by V. Shumlyanskyy

Report of the Uzbek National IAGOD Group for 2002

1. Three republican meetings were carried out in 2002 – at National University, Institute of Mineral Resources and State Committee on Geology and Mineral Resources and one International Scientific Conference (Institute of Geology and Geophysics of an Academy of Sciences).

In these meetings new data on geology and ore potential in the territory territory of Uzbekistan and also information of the geology of neighboring states, were discussed. The materials covered many sections of mineralogy, petrology, geology and genetic models of ore deposits, general metallogeny, and also the
metallogeny of gold, silver, polymetals, vismut, uranium and other metals.

2. Researches on the geodynamic position of the territory of Uzbekistan and adjacent regions, with ideas for forecasting new perspectives for ore-bearing potential and location thereof continued. As an example, it has been established, in the Paleozoic formations of Central Asia, that there exists a special relationship between ore deposits Pb, Zn, Au, rare metals and Ti, Fe, in a zone of transition "paleoocean-paleocontinent". The new geodynamic model for the western part of the Medial and Southern Tian-Shan is developed. On the basis of establishing the connection between different types ore deposits, with their geodynamic envioronments, new perspectives for the occurrence of noble and rare metals are offered.

3. As considered scientifically reasonable, and established in practice, the presence of diamonds has been demonstrated in lamproites and similar rocks from the Central Kyzylkum (similar to the "Australian type"). Rare metal (Nb-Ta) ores are identified relating to pegmatites associated with granitoids in the South of Uzbekistan. A new type of gold - tungsten aposkarn ore type has been established for the Kyzylkum. Large-scale scientific-prospecting and exploration activities aimed at the detection and study of several ore types new to Uzbekistan (iron, uranium, copper and others ores) is conducted. Interesting new ore potential is identified.

4. Scientific collaboration projects have continued in the following directions:

a) Within the international project "Geology, geodynamics, minerageny and modern condition of geological environment in Central Eurasia" with the participation 10 states in the region.

b. Research has been conducted within the international program "Connection of a deep structure lithosphere with concentration of metals". Under this programme, conditions of formation and factors of localization for the unique reserves in the gold ore deposit of Muruntau in Western Tian-Shan are revealed, and the deep breaks in the Central Kyzylkum investigated. These activities are carried out in cooperation with Washington University (Prof. Jan Kutina).

c. A project, carried out together with the Curie University, Paris, France and University of Greenwich, Great Britain, is focused on "Active breaks of the Turan plate revealed from satellite data".

d. Under the grant of Soros Fund 248V2000, together with the territorial department of environment, Bishkek, Kyrgyzstan, the theme "Ecological influence of pollution by radioactive and heavy metals on an environment of Uzbekistan and Kyrgyzstan " is being executed.

e. Under the grant of NATO CLG - EST 977831, together with the University of Liege, Belgium and Institute of Oceanology of Russian Academy of Sciences, Moscow, is executed theme "Climate change in the region of the Aral sea in the past, present and forecasted for the future".

5. Later this year (21-24 October, 2003), there will be an international conference in Tashkent "Problems ore deposits and increase of efficiency of prospec ting activities". The meeting and associated field excursions are expected to attract a broad circle of the scientific geologists expected. Further information can be found elsewhere in this newsletter and at: www.geology.uz.

Contributed by Bakhtiyar Isakhodjaev (mineral@cu.uz)

IGCP 486  Au-Ag-telluride-selenide deposits (and new methodologies for their investigation)

Co-ordinators:
Nigel John Cook, Senior research scientist, Geological Survey of Norway
Kari Kojonen, Senior research scientist, Geological Survey of Finland.

New project 2003-2007
The project is not aimed at pan-regional scale problems of metallogeny or the influence of geodynamics, deep structures and regional tectonics at the orogenic scale. Rather, the project is a vehicle for scientists working on the
processes involved in the genesis of tellurium and selenium-enriched Au-(Ag) deposits, who wish to correlate, compare and contrast their observations and conclusions. The project offers potential for interaction between ore mineralogists and geologists, as well as ore fluid geochemists, all of whom are working at the orefield, mine, or microscopic scales. The project aims at covering the apparent gap between scientists working in the laboratory, either on experimental or microanalytical aspects of deposit mineralogy, and those working in the field documenting and modelling currently exploited ores. The aim is to build an IGCP project that can encourage the cross-fertilisation needed to obtain maximum use of resources for the collective good.

Despite the differing manifestations of ores containing Au (+Ag), comparable ore-forming processes can be recognised across geological time and deposit type. We aim therefore to bring together scientists who are involved with, or who are developing innovative qualitative and quantitative methodologies for the study of these types of mineralisation. This range of activities encompasses research on all aspects of ore distributions, mineral associations and paragenesis, physical and chemical conditions of formation, character and source of ore-forming fluids, chemical and mechanical processes of ore concentration. Participation is open to scientists working on research of both pure and applied aspects, and we particularly welcome researchers from the field of ore beneficiation.

The project is aimed at correlation of human understanding of geological processes causing accumulations of gold (+silver) over space and time, the mineralogy of these deposits and the internal and external controls on the mineralogical distributions. Comparison and analogy with other productive and potential regions worldwide will play an important role in the project as will exchange of ideas, education and training of scientists in traditional and modern investigative techniques. Scientists from all continents and as many countries as possible, including especially developing countries, are invited to participate in IGCP 486. Although direct IGCP funding is limited to assisting scientists from poorer countries to attend meetings and become involved with training programs and field excursions/workshops, we would hope that this IGCP programme will act as a catalyst for appropriate financing from other agencies ranging from national research councils to industrial sponsors. Among the goals would be agreement on an internationally accepted set of definitions and terminologies.

The project will include symposia/fieldtrips/short courses/workshops (either as part of existing scientific meetings or arranged separately), field guides, monographs and other written publications, and a website. Most importantly, the project is also designed to allow scientists to exchange knowledge and information. Research themes communicated by project participants include:

- Ore mineralogy / paragenesis of gold-bearing systems.
- "Exotic" trace mineral associations as tracers for behaviour of precious metals-carriers and fluid paths during gold deposition.
- Predictability of tellurides, selenides and accompanying sulphosalts in gold-bearing ores; experimental modelling of the behaviour of Te and Se.
- Role of Bi and/or As precipitates as gold scavengers in high-temperature deposits (Au skarns; metamorphogenic sulphide ores, remobilisation)
- Relationships between Fe/Ti oxides in metamorphosed terranes as potential tracers for sulphidation/oxidation reactions and gold deposition.
- Links between Sb-bearing sulphosalts and fluorine enrichment in host rock; possible indication of high-sulphidation environments in metamorphosed deposits. Au-tellurides - modelling of oxidation state of fluids.
- Crystal-growth processes and depositional environments; morphologies of native gold.
- Metasomatism / behaviour of gold, tellurium and selenium in skarn and porphyry systems (epithermal transition).
- Devolatilisation and secondary boiling in magmatic-hydrothermal systems: tracers for abrupt changes in fluid parameters with impact to Au extraction; comparison between Au in porphyry, skarns and epithermal massive sulphides.
- Mineralogical indicators of genetic evolution and physical-chemical environments of Au deposits. Speciation in extended magmatic hydrothermal systems, tracers for zonation/fluid evolution. Implications as prospecting tools.
- Comparison between 'simple' hydrothermal systems and, for example, complex stratovolcano or volcano-sedimentary complexes: implications for environment of gold deposition.
- Styles of hydrothermal alterations in gold deposits: inferences for gold enrichment in sulphide/oxide deposits (e.g. iron oxide-copper-gold deposits).
- 3D modelling of Au areas; role of host rock in focusing and channelling ore-bearing fluids.
Activities of IGCP 486 are still being planned and will be made public shortly. Please contact the principal co-ordinator for information and to be added to the project mailing list.

Report of the Mongolian National IAGOD Group for 2002

Workshops, Symposia:
The symposium “Problems of Mongolian Geology” was held on October 19-20 2002 in Ulaanbaatar at the School of Geology of the Mongolian University of Science & Technology. Thirty seven presentations related to geology, ore deposits and metallogeny, hydrogeology and environmental study were discussed and published in the scientific journal “Geology”, No. 6, 7 in October 2002.

Dr. Jeffrey Hedenquist, Colorado School of Mines, USA, was invited by Ivanhoe Mines and the IAGOD National Group on 19 November, 2002, to present an overview of epithermal deposits and their characteristics, covering aspects related to their exploration. He also discussed the transition from the porphyry to the high-sulfidation epithermal environment, including insight from the study of active volcanic systems. More then 100 Mongolian geologists and students, as well as foreign geologists working in exploration projects in Mongolia attended the lectures.

The Spring Symposium 'Geology and Geoeccology of Mongolia, GEM, 2003', was held in March in Ulaanbaatar. In the session “Geology and Paleontology”, members of IAGOD national Group presented 10 oral and poster presentations. Mongolian Geoscientists No. 19 was published.

Members of our IAGOD National Group also attended the 11th Quadrennial IAGOD Symposium and GEOCONGRESS 2000 hold in August in Namibia and excursion in South Africa, kindly supported by Ivanhoe Mines.

Attendance in IGCP and other International and Domestic Projects
- IGCP 420 'Continental Growth in the Phanerozoic: Evidence from Central Asia'.
- 1:200 000 scale geological map of Mongolia

Published map:
'Distribution Map of Mineral Deposits and Occurrences in Mongolia, scale 1:1,000,000' with tables of significant Mineral Deposits and Occurrences (14 sheets), 340 pages, including 417 deposits and 3663 occurrences. This has been compiled by G. Dejidmaa, B. Bujinlkam, T. Ganbaatar, N. Oyuntuya and B. Enkhtuya, and edited by J. Lkhamsuren, G. Dejidmaa, O. Gerel, S. Dandar, Sh. Batjargal, B. Bold-Erdene and D. Batbold. The map was published in 2002 in both English and Mongolian versions.

Selected publications of the National Group:
Beijing. 40-42.


We remember our loss:

Sh. Batjargal, Ph.D., Professor of the Mongolian University of Science & Technology passed away in August 2002. Prof. Batjargal graduated from the Mongolian State University in 1970 and was involved in the mapping and prospecting project in eastern Mongolia. In 1984 he defended his Ph.D. degree at the Novosibirsk Institute of Geology and Geophysics, Siberian Branch of Russian Academy of Sciences with the thesis “Mesozoic endogenic ore deposits of Nukhet Davaa area, Eastern Mongolia”. From 1972 onwards, he was an assistant, associate professor and professor of Economic Geology at the Dept. of Geology and Mineralogy. He developed courses in economic geology and published more than 100 books and papers in the field of base metal deposits in Mongolia.

B. Chuluun, M.Sc., Mineral Resources Authority of Mongolia (MRAM) passed away in April 2003. B. Chuluun graduated from the Mongolian State University in 1980 and worked in exploration of coal deposits in Eastern Mongolia. In MRAM he was responsible for mineral resources prospecting and exploration.

IAGOD National Group of Mongolia:

Chairwoman: Prof. Ochir Gerel (Mongolian University of Science & Technology. P.O. 46, Box 520, Ulaanbaatar 46, Mongolia. Tel: 976-11-326425; Fax: 976-11-324121; E-mail: gerel@mtu.edu.mn). S. Dandar (secretary, MUST), J. Lkhamsuren (MUST), S. Dashdavaa (NUM), G. Dejidmaa (Geoinformation Center). N. Amitan, (Togs Buiant Ltd); D. Bat-Ulzii (MUST), J. Ganbold (Mong. Acad Sci, IGMR), B. Delgertsogt (Geoinformation Center), B. Munkhtsengel (MUST), Sunjidmaa (MRAM), M. Tobileg (MUST), D. Sharkhuukhen (M & Diamond Ltd), D. Altankhuyag (MUST), A. Tsend-Ayush (M & Diamond Ltd). A. Gotovsuren (Mongol Gazar Ltd, Mongolia) B. Batkhishig (Tohoku University, Japan), O. Chuluun (MRAM), D.Batbold (MRAM), D. Bold-Erdene (Khuder Ltd.), H. Gantumur (MRAM), S. Oyungerel (MUST), G. Ukhnaa (MUST), H. Enkhtuvshin (Gallant Minerals Mongolia Ltd.), S. Oyungerel (NUM, Faculty of Earth Science, Dept. of Geology & Mineralogy), G. Ukhn (Dept of Mineral Exploration, MUST), J. L. Jargal (NUM, Dept. of Geology), Yo. Majjigsuren (Dept. of Geology and Mineralogy, MUST), S. Myagmarsuren (Geoscience Center, MUST), S. Jargalan (Dept. of Mineral Exploration, MUST).
New IAGOD members
D. Dorjgotov (National University of Mongolia, Dept. of Geology), S. Myagmarsuren (Mongolian University of Science & Technology, Geoscience Center), S. Jargalan (Department of Mineral Exploration, Mongolian University of Science & Technology).

Contribution by Prof. Ochir Gerel, Dept. of Geology & Mineralogy, Mongolian University of Science & Technology, P.O. 46, Box 520, Ulaanbaatar 46, Mongolia. Tel: 976-11-326425; F: 976-11-324121. e-mail: gerel@mtu.edu.mn

Report of the Czech IAGOD National Group for 2002

Activities in 2002

The Czech IAGOD group organized, together with the Czech Geological Survey, the International Workshop Uranium Deposits: From Their Genesis to Their Environmental Aspects. The workshop was held in Prague, Czech Republic, 10th-11th September 2002. A total of 92 scientists, mining engineers and managers from Austria, Australia, Brazil, Canada, Czech Republic, Egypt, France, Germany, Great Britain, Russia, Slovakia, Spain, Switzerland and USA participated in the workshop programme. The meeting was preceded by the field trip to the Příbram uranium ore district. The field trip after the workshop visited the area of Hamr and Rožná uranium deposits.

The scientific programme of the workshop included keynote lectures given by M. L. Cuney (University of H. Poincaré, Nancy) on the Variscan belt tectono-thermal evolution and the genesis of vein-type uranium deposits, by L. Hecht (University of Berlin) on the hydrothermal alteration of uranium-bearing accessory minerals and by M. Pagel (University of Paris-Sud) on the mineralogy and geochemistry of uranium mill tailings. Moreover, 42 papers, presented either as poster or oral presentation were given by participants in two sessions: (1) Geology, mineralogy and geochemistry of uranium deposits and, (2) Environmental aspects of uranium mining. The extended abstracts prepared by authors in camera-ready form were printed prior to the workshop by the Czech Geological Survey (177 pages; B. Kršek and J. Zeman, Editors).

Members of the Czech IAGOD presented several papers and posters focussed on ore geology and environmental aspects of mining at the 11th Quadrennial IAGOD Symposium and Geocongress 2002 in Windhoek, Namibia.

IAGOD group members participated in the Certificated Postgraduate Training Course GEOCHIM 2002, held in Prague and Dolní Rožínka (Czech Republic) from September 4 to 18, 2002. This course was organized by the Czech Geological Survey and IGCP 429. Thirteen participants from Cameroon, Croatia, Botswana, Iran, Jordan, Nigeria and Russia were trained both theoretically and practically in geochemical exploration methods and their environmental application.

Selected publications of the Czech IAGOD Group:


Future activities:

The IAGOD group members will participate at the organization of the Certificated Postgraduate Training Course GEOCHIM 2003, which will be held in Prague and Rozna September 4th-18th 2003. Information is available from Dr. Jan Pašava, director of GEOCHIM (pasava@cgu.cz).

Contributed by Bohdan Kříbek, Chairman of the Czech IAGOD Group (Czech Geological Survey, Klárov 3, P.O.B. 85, 118 21 Praha 1, phone +420-2-51085518, fax: +420-2-5817390, E-mail: kribek@cgu.cz)

Report of the Slovak IAGOD National Group for 2002

Conferences in 2002:

Members of the Slovak IAGOD group took effective part in the international symposium "European silver deposits and the influence of their exploitation on environment" in Banská Štiavnica, on May 22-24th 2002, organized by the Ministry of Environment of the Slovak Republic. Many experts (about 100 participants) from Slovakia, Czech Republic and Hungary took part in this symposium. In total, 22 papers were presented at this conference. The articles and abstracts of the contributions wereakk published in the conference proceedings (published by the Slovak Mining Museum, Banská Štiavnica, 2002). The main topics of the conference were:

The European and world importance of the Slovak silver-bearing mining in the past (J. Novák),
Industrial types of silver deposits, their present exploitation in Europe and in the world and the impact of the mining activities on environment. (M. Tréger - P.Baláz - S.Ciemanová)
From the mining history of the Příbram region, Czech Republic (J. Velfl),
Undertaking and power in the mining of Lower Hungary (Bircher E.),
Historical significance of silver bearing district of Banská Štiavnica and Hodruša deposits (J. Novák),
Silver occurrences in mineralized systems of Banská Štiavnica - Hodruša ore district (Š. Hurtík),
Ag-minerals of the Banská Štiavnica and Hodruša deposits (S. Jeleň - M.Háber),
Silver on the deposits in the Tatric unit of the Western Carpathians (T.Mikuš - J.Luptáková - M.Chovan),
Silver mineralization of the Strieborná vein in the Rožňava deposit (T. Sasvári - L. Mato).

Members of the Slovakian IAGOD group also actively took part in the "XVII th Congress of the Carpathian - Balkan Geological Association", organized in Bratislava, 2002 September 1st-4th, and followed by a post-Congress excursion crossing the Western Carpathians. The conference and the excursions were attended by 498 participants from 24 countries from Australia, Asia and Europe, but mostly from the 13 member countries of CBGA (Albania, Austria, Bulgaria, Czech Republic, Greece,
Hungary, Macedonia, Poland, Romania, Slovak Republic, Slovenia, Ukraine and Yugoslavia).

The Congress was divided into five sessions:
I. Sedimentology, Paleogeography, Basin Evolution, Stratigraphy and Paleontology, Climate Change,
II. Mineralogy, Econ. Geology and Mineral Resources, Radiogenic and Stable Isotopes, Petroleum Geology,
III. Lithosphere Structures, Seismology and Earthquake Hazards, Geophysical Interpretation,
IV. Structural Geology and Tectonics, Volcanic and Plutonic Processes, Metamorphic Processes,
V. Hydrogeology and Geothermal Energy, Environmental Geology and Geochemistry, Engineering Geology and Remote Sensing, Pollution of Environment and Quality of Life, Quaternary Geology.

During the congress, a total of 212 lectures were presented, of which 13 were in the section on Mineralogy, Economy Geology and Mineral Resources. 132 posters were exhibited, 26 in the above section. Abstracts of lectures and posters have been published in the journal Geologica Carpathica (2002, 53, No.5) and a special issue of Geologica Carpathica in CD form.

Current list of the members of the Slovakian IAGOD group (up to Dezember 31th 2002):
1. Franzen Jozef Dr., Ministry of Environment Slovak Republic, Nám. L. Štúra 1, 812 35 Bratislava, t.:421/02/5162132 f. 421/02/5162248
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4. Hurai Vratislav Dr., Department of Mineralogy and petrology Faculty of Natural Sciences, Comenius University, Mlynská dolina G, 842 15 Bratislava, t.: 421/02/796 365, f.: 421/02/375663, huraiova@fns.uniba.sk
5. Chovan Martin Doc.Dr., Department of Mineralogy and petrology Faculty of Natural Sciences, Comenius University, Mlynská dolina G, 842 15 Bratislava, t.: 421/07/375663, chovan@fns.uniba.sk
6. Jeleň Stanislav Dr., Geological Institute of SAS, Severná 5, 97404 Banská Bystrica, t.: 421/48/4123943, f.: 421/48/412 4182, jelen@savbb.sk
8. Michálek Jozef Dr., ENVIGEO, s.r.o., Kynceľovská 10, 974 01 Banská Bystrica, t./f.:421/48/4144195
10. Rojkovič Igor Prof.Dr., Department of Geology of Mineral Deposits Faculty of Natural Sciences, Comenius University, Mlynská dolina G, 842 15 Bratislava G, t.: 421/02/796 279, f.: 421/02/729 064, rojkovic@fns.uniba.sk

Contributed by Milan Haber, Geological Institute Slovak Academy of Sciences, Severná 5, 97404 Banská Bystrica, Slovak Republic, T.: 421/48/4123943; F.: 421/48/4124182; e-mail: haber@savbb.sk

IAGOD PROCEEDINGS STILL AVAILABLE……


Proceedings of the Ninth Quadrennial IAGOD Symposium held in Beijing, China, Aug. 12-18, 1994. Edited by
Report of the IAGOD Commission on Placer Deposits (COPD) for 2002-3

In 2002 for the first time in the IAGOD activity the special session on placer deposits (“Placers: from Source to Sea”) was held in frames of the 11th IAGOD Symposium (Windhoek, Namibia). It was remarkable that this session took place in Africa well known for its great placer deposits. There were two meetings with nine oral presentations dedicated to a wide spectrum of questions of placer geology and minerogeny. The main emphasis was placed to ancient placer deposits related to fossil sedimentary formations, including Precambrian ones, to evolution of placer formation in the Earth’ history, to transformation of placer material on its way from primary sources through intermediate hosts up to the seafloor.

Publications:

The monograph of Academician N. Shilo “Doctrine of Placer Deposits (Placer-forming ore associations and Generation Theory)”. The 2nd edition (Vladivostok: Dalnauka, 2003, 576 p.) is the first-rate publication on placer deposits for the five last years. It contains a comprehensive fundamental analysis of placer deposits of various minerals, their interdependence with geodynamic and geochemical processes occurring in the zone of lithosphere, hydrosphere and atmosphere. The author introduces into the geological science some new categories being of importance for placer formation, such as periglacial lithogenesis, constant of hypergene stability, technogenic placers, etc. The monograph publication was dedicated to the 90th anniversary of the Nikolay Shilo.

Others publications are:


Spade-work related to proposed events:

1. It was accepted to organize a special session on placer deposit geology (Placer formation on active continental margins) in the frames of the Interim IAGOD Conference on Metallogeny, Magmatism and Metallogeny of Active Continental Margins (Vladivostok, 11-19 September 2004).

2. The preparations for the 13th International Symposium on Placer Deposits are starting. Time and place of this event were determined. It was decided to hold the symposium 15-21 August 2005 in Perm’ in the West Urals region were the famous diamond-bearing and gold-bearing placers and many weathered rock deposits are located. At least three field excursions are planned: 1. Diamond placers of the Verkhnevishersky region (“Uralalmaz” Mine); 2. Kungur icy-karst cave and its surrounding; 3. Salt-mines of “Uralkaly’ Joint-stock Company and artificial waste deposits. The list of field excursion can be added.

Contributed by Secretary of COPD, Natalia G. Patyk-Kara, IGEM RAS; e-mail: pkara@igem.ru
IAGOD Commission on Placer Deposits (COPD):
Chairman: Academician Nikolay A. Shilo, Russian Academy of Sciences, Moscow, Russia
Vice-Chairman: Dr. Jan Krasson, Geoexplorers International Inc., Denver, USA; e-mail: geoexpl@eazy.net
Secretary - D. Sc. Natalia G. Patyk-Kara, IGEM RAS

ANNOUNCEMENT: August 15th -21st 2005 13th INTERNATIONAL SYMPOSIUM ON PLACERS AND WEATHERED ROCK DEPOSITS (Quadrennial meeting), Perm’, Russia.
Contact: Permian State University, Bukirev Str., 15, 614990 Perm’, Russia: Professor B. Lunev, e-mail: naumov@psu.ru; prof. N.Patyk-Kara, e-mail: pkara@igem.ru

On the occasion of the 90th Anniversary of Academician Nikolay Shilo
IAGOD member from 1964, Chairman of IAGOD Commission on Placer deposits Academician of Russian Academy of Sciences Professor Nikolay Alexeyevich Shilo observed his 90th Anniversary on April 7th 2003.

He is outstanding scientist in the field of economic geology, palaeogeography, lithogenesis, founder of the modern doctrine on placer deposits, leader of Russian National school of placer deposits geology and prominent organizer of the Russian science. His latest paper is a comprehensive voluminous book ‘The Doctrine of Placer Deposits” issued in 2002 (second revised edition of the monograph first published in 2000.

N.A. Shilo was born in Pyatigorsk, North Caucasus, Russia. In 1932 he arrived to Leningrad to become a student of famous Mining Institute, where his meeting with outstanding Russian geologist Professor Yu.A. Bilibin has channeled his further creative way marked by self-forgetful adherence to geology, metallogeny and prospecting for placer deposits.

He began his practical geological work in 1937 in the Far North-East of Russia (Magadan region) where during 12 years has discovered and explored 7 gold deposits. In 1949 he became Director of large scientific institute of gold and rare metals in Magadan. There he has passed a long way from engineering geologist up to the title of Academician, Chairman of the Far East branch of Russian Academy of Sciences.

The scope of scientific interests of Professor N. Shilo is extremely wide and always is on an edge of main problems of geological science, however his main business during more than 60 years of activity was development of the theory and practice in geology of placer deposits. N.A. Shilo has formulated ideas about placer-producing geological formations, substantiated the importance of tectono-geomorphologic evolution of territories for placer formation processes, has offered a systematics of placer-forming minerals on the ground of exogenous stability constant which allows one to approach to a quantitative estimates of placer formation, has expanded and modernized the theory of continental lithogenesis, has proved a determining role of periglacial (cryogenic) stage in creation of the largest gold
placers not only for the Russian North Far-East, but also for other placer ore provinces, thus having created fundamental basis for placer deposits prospecting. He is the indisputable leader of national school of placer geology. The numerous representatives of this school are working now in various regions of the country and abroad.

Even the simple list of scientific publications by N.A. Shilo, comprising more than 700 titles and including 17 monographs, characterizes him as a truly encyclopedic scientist. He has offered an interesting concept of natural medium development under conditions of cold periglacial climate, he made a considerable contribution to study of geodynamics and metallogeny of volcanogenic belts, first of all for the Pacific system of marginal continental volcanogenic belts with their gold-silver and silver metallogenic specialization.

At the end of the 1990s, N.A. Shilo has addressed problems which until now have no simple solution, the origin of Solar system, causes of ozone layer destruction, reasons for the extinction of mammoths and the nature of Caspian sea level fluctuation. It is possible to tell, that characteristic features of many N.A. Shilo’s investigations are non-trivial and, at the same time, synthetic approach to the solution of most complicated problems, which force the experts to look for new solutions of seemingly well-investigated phenomena. A good example in this respect is the fundamental monograph, which was published in 2000, "Doctrine of Placer deposits" (2nd revised edition - in 2002), not only considering current theories of placer deposits formation, but also focusing attention on problems that still have to be solved.

The scientific-organizational activity of N.A. Shilo is huge. His name is closely connected to creation and progress of the majority of scientific, industrial and educational institutions of East and Northeast of Russia. These are the VNII-1, the North-East Complex Research Institute (SVKNII), the Magadan branch of TINRO (Pacific Institute of Fishing and Oceanology), Institute of Biological Problems of North, Institute of a radio-space physics, Magadan branch of the Khabarovsk polytechnical institute, the network of seismic stations and Anadyr geological expedition. For all these organizations he personally selected and formed the staff.

N.A. Shilo always attached high importance to international scientific cooperation. He have been delivering series of lectures at universities of Japan, USA, China, England and other countries, as the scientific adviser he cooperated with the mining companies exploiting the deposits of non-ferrous metals. He was active organizer of many international meetings, symposia, congresses, projects; he is a member of executive committee of Pacific Association, where for many years was permanent chairman of scientific committee "Solid shell of the Earth". His activity is responsible for creating the "Pacific Geology" journal, which is being translated into English.

N.A. Shilo is a Hero of Socialist Labor, Russian State Prize winner, an honorary citizen of Magadan and Winnipeg in Canada, and Honoris Causa D.Sc. of University of Ohio in USA.

N.A. Shilo continues to be full of creative energy, ideas and plans. He is also fond of writing poems (two books of which have been published).

The Council of the International Association on the Genesis of Ore Deposits and Foreign and Russian IAGOD members congratulate Professor N.A. Shilo on the occasion of his Anniversary and wish him good health and every success in his polyhedral activity.

On behalf of IAGOD Council, Ingrid Kigai; and members N. Cook, R. Seltmann, R. Grauch.

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**Report of the IAGOD Commission on Industrial Minerals and Rocks (COIMR)**

This group, which was set up in 2000, has started to develop its activities, but on only on a very small scale, and almost entirely through informal discussions between members. Further feedback from all IAGOD members to the Chair of COIMR (P.Scott@csm.ex.ac.uk) on how the Commission should
develop is requested. Initial suggestions are an IGCP project, but there are other possibilities, which could provide funds to enable a larger scale project to be developed.

There were a few papers on industrial minerals presented at the 11th IAGOD Symposium in Windhoek, but no specifically themed Industrial Minerals session. A pre-conference workshop entitled Minerals from Waste, hosted by the British Geological Survey, in collaboration with the Ministry of Mines and Energy of Namibia, provided an overview of the potential for industrial mineral products to be developed from mining wastes. Case studies using waste from former metal mining areas were included. A published report entitled ‘Minerals from Waste’ is available from the British Geological Survey (djha@bgs.ac.uk). This project was funded by the U.K. Government Department for International Development.

The 7th Biennial SGA Meeting in Athens (24-28 August, 2003) will have a large session on industrial minerals, with over 15 papers offered for presentation on a wide range of topics (see www.igme.gr/sgaconference.htm). It is hoped to have an informal COIMR meeting during the conference, to give those interested an opportunity to discuss how the group should develop.

COIMR is happy to support a series of international workshops, hosted by the British Geological Survey, on ‘The effects of River Sand Mining’. These are to take place in the next two years. Two are planned for December 2003 in Jamaica and Costa Rica. Further ones will be held, most likely in Southern Africa and the Indian sub-continent. Uncontrolled extraction of sand and gravel from active river systems can have important environmental consequences in some countries, causing damage to infrastructure such as bridges, water supply and fisheries and other ecosystem problems. Details can be obtained from David Harrison (djha@bgs.ac.uk).

Greta Orris has been appointed as Secretary of COIMR, replacing Joseph Briskey.

**Officers of COIMR:**

Chair: Peter W. Scott, Camborne School of Mines, University of Exeter, Redruth, Cornwall TR15 3SE, UK. (P.Scott@csm.ex.ac.uk)

Vice Chairman: Ronghua Zhang, Chinese Academy of Geological Sciences (zrhhsm@pku.edu.cn)

Secretary: Greta Orris, United States Geological Survey (greta@usgs.gov)

*Contributed by Peter W. Scott*

**SOCIETY FOR GEOLOGY APPLIED TO ORE DEPOSITS (SGA)**

**Executive Committee (2003)**

President: D. Leach (USA)

Vice-President: P. Fenoll-Hach Ali (Spain)

Executive Secretary: J. Pašava (Czech Republic)

Treasurer: P. Herzig (Germany)

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**Councillors through December 31, 2003**

D. Eliopoulos (Greece), A. Bjorlykke (Norway), B. Gemmel (Australia), I.R. Jonasson (Canada), F. Mitrofanov (Russia), H. Stein (USA)

**Councillors through December 31, 2005**
The IAGOD Working Group on skarns

The www-site of the IAGOD Skarn Working Group is the main activity of the group and can be found at: http://www.wsu.edu:8080/~meinert/skarnHP.html. The website is designed to coordinate research and interest in skarns. It is continually being updated and is a source of much information on skarn deposits, their classification and characteristics. An extensive bibliography accompanies the text and illustrations. A skarn list server has been established to facilitate discussion among researchers. To subscribe, send a message to: listproc@listproc.wsu.edu

Contact: Larry Meinert, Chairman of the IAGOD WG on Skarn Deposits, Department of Geology, Washington State University, Pullman, WA 99164-2812; phone: 509-335-2261 (office); 509-335-3009 (secretary); fax: 509-335-7816; e-mail: Meinert@wsu.edu

Report of the Working Group on Thermodynamics of Natural Ore-Forming Fluids for 2002

Some recent publications of the members of the Russian Working Group on Thermodynamics of Natural Ore-Forming Fluids:


Contribution by Prof. Nikolai Akinfiev

International Geological Correlation Programme

The IGCP was founded in 1972 at the 24th International Geological Congress in Montreal, Quebec, Canada and is therefore now 30 years old! The goal was to create an ambitious global program of scientific collaboration between working scientists, rather than between governments. From the beginning, the program has operated as a joint initiative of the International Union of Geological Sciences (IUGS) and the United Nations Educational, Scientific, and Cultural Organization (UNESCO). The IUGS serves as a scientific guide, while UNESCO handles operational and administrative matters.

Projects are selected and annually reviewed by the IGCP Scientific Board. Visit the IGCP website for more information about the IGCP, a full listing of current projects and details of application procedures at: [http://www.unesco.org/science/earthsciences/igcp/](http://www.unesco.org/science/earthsciences/igcp/)

IGCP Projects active in 2003 on issues concerning ore deposit geology:


# 443 - Magnesite and Talc-Geological and Environmental Correlations M. Radvanec (Slovak Republic), W. Prochaska (Austria), A. C. Gondim (Brazil), C. Kequin (China) 2000-2004. [http://www.gssr.sk/igcp443](http://www.gssr.sk/igcp443)


# 473 - GIS Metallogeny of Central Asia R. Seltmann (United Kingdom), 5 young scientists 2002-2006

# 486 - Au-Ag telluride-selenide deposits (2003-2007). Nigel Cook (Norway), Kari Kojonen (Finland). Contact: Nigel.Cook@ngu.no for further details. Website coming soon!
Based on a written presentation to the IAGOD Council Meeting at the 11\textsuperscript{th} IAGOD Symposium in Windhoek, Namibia, July 2002, extended April 2003.

**IGCP-354 “Economic Superaccumulations of Metals in the Lithosphere”**

In 1994 Prof. Rongfu PEI of Chinese Academy of Geological Sciences and Prof. Peter Laznicka (Canada) invited the CTOD WG1 to participate in resubmission of a project proposal to UNESCO. The proposal was approved and became the IGCP-354 ‘Economic Superaccumulations of Metals in the Lithosphere’.

Our involvement in the project, focused on the role of deep lithospheric structure in the concentration of metals, was discussed with Prof. Brian Skinner at Yale University and, prior to submission, distributed worldwide for comments.

The IGCP-354, submitted to UNESCO through the Chinese National Committee, was approved as a 5-year project, with Acad. Rongfu Pei as the Leader and Prof. Peter Laznicka (Canada), Prof. Jan Kutina (USA) and Acad. D.V. Rundqvist (Russia) as Co-Leaders.

The project covered essentially two major fields:

1. **To develop a quantitative system for the study of world-class deposits of all industrial metals, defining the magnitude categories (giant, supergiant) of metal accumulations. Also, compilation of a world map of large and superlarge ore deposits.**

   Reference to the main results:

2. **To investigate the geological, geophysical and geochemical parameters which control the genesis and global distribution of the largest concentrations of metals.**

   This question, with special reference to the role of deep lithospheric structure has been approached from different angles at five international workshops: In 1995 at the U.S. Geological Survey in Reston, Virginia, U.S.A.; in 1996 at the IGC in Beijing, China; in 1997 at Puerto Ordaz in Venezuela; in 1998 at the University of Ballarat in Australia, and in 1999 at the Joint SGA-IAGOD Meeting at Imperial College in London.

   A special session on “Mineralogy of Large and Superlarge Mineral Deposits” was organized by D.V. Rundqvist at the 17\textsuperscript{th} General Meeting of the International Mineralogical Association in Toronto in 1998.

   Invited papers have reviewed the state-of-the art of gravity and magnetic methods in application to the controls of major ore deposits (T.G. Hildenbrand et al.), remote sensing methods (L.C. Rowan) and mathematical techniques (F.P. Agterberg).

   Scientists of 14 countries took part in the project studies. The project concluded that deep lithospheric structures and geological time have played a very important role in the genesis and global distribution of the largest concentrations of metals in the crust. Three-dimensional models have been presented. The role of mantle convection cells has been shown. The role of mantle-rooted structural discontinuities and their intersection with structures of other trend has been recognized and used in compilation of a new type of mineral prognosis maps.

   Most of the papers of this part of project have been published in several issues of ‘Global Tectonics and Metallogeny’, printed and distributed by E. Schweizerbartsche Verlagsbuchhandlung in Stuttgart, Germany.

   Examples of a few titles:


All papers of the project, both published and submitted for publication, are reviewed in a recent paper by Jan Kutina, Rongfu Pei & Allen Heyl “The Role of Deep Lithospheric Structure in the Genesis and Distribution of Giant and Supergiant Concentrations of Metals in the Crust”. Global Tect. & Metall., Vol. 8, in press (expected date: June 2003).

**Deep Structure of the Earth and Concentration of Metals in the Lithosphere: A Geodynamic Approach**

As a follow-up of the IGCP-354, we have designed a new program, setting the genesis of ore deposits in the context of geodynamic evolution of the whole Earth as a planet. A close cooperation has been established with the Geodynamics Branch of the NASA Goddard Space Flight Center and a new workshop prepared.

Thanks to Dr. Arthur Schultz, Chief of the Eastern Mineral Resources Team of the U.S. Geological Survey, the participation of invited scientists from Russia, China, Czech Republic and Uzbekistan was supported, and the travel and accommodation of the U.S. geophysicists funded. A workshop of the above title was held at the USGS in Reston in September 18-20, 2001, Convenors: Dr. Patrick T. Taylor of the Goddard Center and Dr. Jan Kutina of American University and the USGS.

The papers included very important contributions on sublithospheric levels of the Earth. Stimulus from the studies of the dynamics of the core, core-mantle boundary, and processes in the mantle indicated that these deeper regions could influence the distribution of metals in the shallow crust. There are indications that non-hydrostatic pressure connected with the rotation of the inner core and acting at the core-mantle boundary may produce deformation throughout the mantle. This question, addressed by Dr. Weijia Kuang is of a special interest as it may help to reveal deep-rooted import pathways for the transport of heat, magmas and finally ore-forming fluids towards the earth’s surface. These observations indicate that very deep regions can play a role in determining large-scale distribution of crustal mineralization. For more information see EOS, Transactions, American Geophysical Union, Vol. 83, No.10, March 5, 2002, page 103, and the titles with a brief information on each workshop paper in the IAGOD Newsletter 2002, p.38-41. Full text of the papers, along with an extensive review of the IGCP-354 results, will appear in Vol. 8 of Global Tectonics and Metallogeny (in press, expected date of publication June 2003).

**Most recent activities:**

**Updating and publishing of Parts B of workshop papers and a Special Session held in Toronto**

The five international workshops organized during the 5-year IGCP-354, each focused on a special topic, have produced collections of very important papers. However, the time needed for preparation of a new workshop every year, did not allow us to finish the editing of all papers of the previous workshop in due time. We apologize to the authors and are preparing Parts B of workshop papers, as well as papers of a Special Session held at the IMA Meeting in Toronto. Information on new important results will be added whenever available, or an additional paper included, noting the date of its incorporation.

Under preparation for Vol. 9 of ‘Global Tectonics and Metallogeny’:


2. Part B of papers of the Second Workshop of IGCP-354 held at the 30th IGC in Beijing, China in 1996. (Part A with 12 papers published in GTM, Vol.7, No.1, February 1999). Part B will include the following invited papers:

M.A. Favorskaya & S.M. Zhdanov: Ore-bearing structural nodes on the Pacific Ocean floor.
I.N. Tomson & V.V. Seredin: Metallogenic role of hydrocarbon degassing of the mantle.

Updating, related to the paper by M.A. Favorskaya and S.M. Zhdanov:
J. Kutina: Can a uniform pattern of latitudinal structural discontinuities extend beneath the present continental and oceanic areas? [preliminary title]

Preparing a new project expanding the topic of the last workshop:
[preliminary title]

Background data for some questions proposed for the new project
(first draft for consideration)

The role of deep tectonics in the concentration of metals in the crust has been known for several decades and used in mineral exploration in different countries (e.g. Favorskaya, Tomson, et al. 1974; O’Driscoll, 1985). However, as late as 1995-2000, under the IGCP Project No. 354 “Economic Superaccumulations of Metals in the Lithosphere” has this question been studied in a systematic way.

It was found that the fracture zones controlling the largest ore deposits and ore clusters are usually parts of much longer transregional structural discontinuities which extend for hundreds or even thousands of kilometers, but usually not well expressed in the surface geology. The largest concentrations of metals occur in places where these discontinuities intersect with deep-seated structures of other trends (Kutina, 2001; Pertsov et al..2003). The long-extending discontinuities commonly occur in sets with spacing of several hundred kilometers. A striking similarity has been found in the spacing of east-west trending transregional structures of the United States and China (Kutina, 1983, 1999). Moreover, a similar spacing was documented between the latitudinal structures of the United Stats and the east-west fracture zones of the Atlantic and Pacific Ocean floor.

As magmatism and ore-forming fluids were guided by deep-seated structures, then the intrusive/volcanic centers and associated ore deposits can be used as “markers” identifying the time when the ore-controlling structures have already existed. Rundqvist & Kravchenko (2001) demonstrated the duration of time under which major ore deposits have been formed, in stages controlled by the same conduits.

The global magnetic anomaly maps based on satellite measurements (Regan et al., 1975; Langel et al., 1982) reveal a pattern of east-west trending belts of magnetic highs and lows. Prominent changes in the magnetic amplitude of these belts (giving the impression of their interruption) occur at the intersection of these belts with transverse structures. Using the MAGSAT anomaly map of South America by Ridgway & Hinze (1986), Kutina & Taylor (2003) found out that the large concentration of tin in the state of Rondonia in western Brazil, associated with the intrusion of mid-Proterozoic granitic rocks, occurs in an area of a prominent change of magnetic amplitude of an east-west belt, caused by the intrusion of granitic magma along a major fault zone extending transversely to the belt. It indicates that the latitudinal belt of
the global magnetic map existed there prior to the intrusion of the granitic rocks which occurred in mid-Proterozoic.

We do not yet know at which depth the latitudinal belts of the global magnetic anomaly maps originated. However, their presence on a global scale, as well as the presence of east-west trending transregional structures with similar spacing may indicate a uniform pattern of discontinuities at sublithospheric levels of the Earth, propagating upwards into the crust. The theoretical calculations of preferential east-west fracturing, related to the stresses caused by changes in the speed of rotation of the Earth (Stovas, 1963a,b) deserve special attention. Several other parameters would have to be discussed as well, including the changes in the size of the Earth.

The latest geophysical studies admit deformation of the lower mantle as caused by non-hydrostatic pressure on the core-mantle boundary, related to rotation of the solid inner core (see explanation by W. Kuang, 2003).

As the long-extending transregional structural discontinuities, detected in the surface or subsurface geology, may indicate a uniform pattern of structures in deeper parts of the Earth, then a study of possible interaction between these linear features and the lithospheric plates becomes a topic of special importance and needs to be investigated. As an example may serve the boundary between the Laurasia and Gondwana-land, along which a part of the Tethys Ocean originated (Sengor & Yilmaz, 1981). It was found that this boundary correlates with the pre-existing Forty-north (latitudinal) discontinuity traced on a global scale (Kutina, 2003, in preparation).

On the other hand, there have been documented tectonic lineament zones of other directions, especially meridional ones, extending for distances from 3000 to 6000 km, with a width of 200-300 km (Bush, 1983). One of these lineament zones, described by Bush, extends southward from the polar region of the White Sea, crossing the Caucasus Mts. between the Black Sea and the Caspian Sea, and gets connected, on its southern end, with the Dead Sea Rift. An extension of the Dead Sea Rift into eastern Turkey has been noted by other authors, and its relation to the East Anatolian faults studied (Perniceck & Cemen, 1990; Kocyigit & Beyham, 1998).

Preliminarily, it seems that at least some of the boundaries originated by breaking down of the Pangea are related to pre-existing deep structural boundaries in the sublithospheric mantle. Others, such as the Dead Sea Rift and its northern extension into Anatolia and perhaps farther north, are younger than the plates (the “trans-plate” lineaments of Bush, 1983), but still can be controlled by sublithospheric zones of tectonic weakness.

A detailed study of possible relationships between linear structural discontinuities and plate tectonic evolution will provide a background for independent checking of the paleo-reconstructions based on paleo-magnetism. At the same time, this study may have a major impact on the development of mineral prognosis maps. It may also help to further develop the concept of metallopect superimposed by the lithospheric mantle. Others, such as the Dead Sea Rift and its northern extension into Anatolia and perhaps farther north, are younger than the plates (the “trans-plate” lineaments of Bush, 1983), but still can be controlled by sublithospheric zones of tectonic weakness.

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References


Kutina, J. (1999): Ore deposit controls by fracture patterns of the crust and by mantle-rooted structural


The above section proposing some questions to be addressed under the new project has been prepared by the undersigned and is presented here to initiate discussion. The proposal will be discussed within the Commission on Tectonics of Ore Deposits and members of WG1. Comments on this first draft and any suggestion will be welcome and appreciated. Please, send us your full mailing address and also the e-mail address if you want to receive further information on the project.

Contributed by Jan Kutina, Chairman, CTOD WG1 ‘Global Tectonics and Metallogeny’, Department of Chemistry, American University, Washington, D.C. 20016-8014, U.S.A. Fax: 202-885-1752
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The Joint 7th Biennial SGA-SEG Meeting

24th-28th August 2003, Athens, Greece

The 7th Biennial SGA Meeting "Mineral Exploration and Sustainable Development" will be held in Athens, Greece (August 24th-28th 2003). Athens is the historical capital of Greece, a scientific and cultural centre and the Host City of the Summer Olympic Games in 2004.

The meeting will be organized by the Society for Geology Applied to Mineral Deposits (SGA) in cooperation with the Institute of Geology and Mineral Exploration, Athens Technical University, University of Thessaloniki and Geological Society of Greece (Section of Economic Geology and Geochemistry).
Under the general theme "Mineral Exploration and Sustainable Development" the organizers would like to bring together economic geology scholars and professional exploration and mining geologists to discuss current issues on ore geology, exploration and sustainable development. Participants are kindly invited to offer papers for oral and poster presentations. There is an opportunity to have meetings and sessions of ongoing and planned Projects and Working Groups. Proposals for conveners and topics of sessions are welcome. Several pre- and post-meeting field trips will be organized and the participants will have the opportunity to visit different metallogenic provinces of Greece and neighboring countries.

The second circular is available from the following address: http://www.min.tu-clausthal.de/www/sga/7th%20Biennial%20SGA%20Meeting.pdf

Contact address: 7th SGA Biennial Meeting, Secretary: Dr. Demetrios Eliopoulos, Institute of Geology and Mineral Exploration, 70 Messoghion Str., GR-115 27 Athens, Greece, Fax: 0030 - 1 77 73 421, e-mail: Eliopoulos@igme.gr

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Report of the IAGOD National Group of Kyrgyzstan for 2002

Chairwoman: Rosalia J. Jenchuraeva (Corr.Member of NAS, Prof., Institute of Geology National Academy of Sciences, 30 Erkindik, 720481 Bishkek, Kyrgyzstan; tel. 996 (312) 66 26 80; Fax: 996 (312) 62 00 47; E-mail: djam@freenet.kg; rodjen@netmail.kg

The group has 21 members:

Djamila Aitmatova, (Inst. Physics & Rock Mechanics NAS), Bakirov, Apas (IG NAS), Bogdetsky, Valentin (CVP), Kabaev, Omorkul (MRI), Kim, Vlas (KMMI), Litvinov, Pavel (KOC), Maksumova, Rena (IG NAS), Nataly Malyukova (Kyrgyz Mining and Metallurgical Institute, Bishkek), Alexander Mikolaichuk (Inst. of High Temp, Russian Acad. of Sc.,Bishkek), Valentin Nikonorov (State Agency on Geology and Mineral Resources of Kyrgyz Republic, Bishkek), Kubat Osmonbetov (Kyrgyz Mining and Metallurgical Institute, Bishkek), Nikolay Pak (Institute of Geology National Academy of Sciences, Bishkek), Orunbay Shamshyev (Osh Technic Univers., town Osh), Gennady Savchenko (State Agency on Geology and Mineral Resources of Kyrgyz Republic, Bishkek), Sorokin, Timofey (Institute of Geology National Academy of Sciences, Bishkek), Vitaly Stavinsky (Kyrgyz Mining Association, Bishkek), Iskander Turdukeev (Institute of Geology National Academy of Sciences, Bishkek), Ilyzar Usmanov (Institute of Geology National Academy of Sciences, Bishkek), Viktor Yakimov (ME&ES), Alexander Yarkov (Kyrgyz Altyn State Concern, Bishkek), Tourat Usubaliev, (Kumtor Operating Company, Kumtor Mining).

Explanations: CVP - Councillor of Vice President, Bishkek; IG NAS - Institute of Geology National Academy of Sciences, Bishkek; IHT - Inst. of High Temp, Russian Acad. of Sc.,Bishkek; KMMI - Kyrgyz Mining and Metallurgical Institute, Bishkek; KMA - Kyrgyz Mining Association, Bishkek; KOC - Kumtor Operating Company, Kumtor Mining; MRI - Mineral Resources Inst., Bishkek; SC KA - “Kyrgyz Altyn” State Concern, Bishkek; SAG&MR - State Agency on Geology and Mineral Resources of Kyrgyz Republic,Bishkek; OTU - Osh Technic Univers., town Osh.

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Episodes - International Geoscience Newsmagazine

'Episodes' is the quarterly science and news journal of the International Union of Geological Sciences (IUGS). It
focuses on the publication of results of scientific research and other information addressing issues of interest to the global earth-science community. Special emphasis is given to topics involving geological aspects of population growth and economic development and their resulting impacts on or implications for society. As the principal publication of the IUGS, Episodes also carries information about IUGS scientific programs and activities. Contributions of the following types of manuscripts are here solicited: 1 scientific articles l conference reports l news and views l letters to editor, book reviews l information on training courses (esp. those geared to participants from developing countries) l noteworthy new publications l including national or regional geologic maps. Episodes also invites photos or other images for the front cover. Photos must be of high technical quality and tell an interesting geological story. A colour transparency and one-colour print (at least 9 cm x 12.6 cm) are required for submissions, which should be supplemented with a short explanatory paragraph (no more than 100 words).

All IAGOD members are urged to support 'Episodes'. Guidelines for contributors are published annually and are always available at the IUGS web site: http://www.iugs.org/iugs/pubs/epiguide.htm. The annual subscription is US$ 24.00, which includes airmail postage.

Contact: Prof. Zhang Hongren, Editor, Episodes, P.O. Box 823, 26 Baiwanzhuang Rd., Beijing 100037, China; phone: +86-10-68320827; fax: +86-10-68328928; e-mail: episodes@public2.bta.net.cn

VLADIVOSTOK - 2004
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Metallogeny of the Pacific Northwest:
Tectonics, Magmatism & Metallogeny of Active Continental Margins

27th August - 4th September, 2004
Vladivostok, Khabarovsk, Magadan
RUSSIAN FAR EAST, RUSSIA

Russian National IAGOD Group
Federal Far East Geological Institute
Far Eastern Branch of Russian Academy of Sciences

Far East Geological Institute, FEB RAS
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INVITATION

The 2004 Interim IAGOD Conference presents an opportunity to bring together the geologists from all over the world in Vladivostok, one of the major cities of the Russian Far East. This area known for its tremendous mineral wealth ranks among the most geologically interesting territories of the Russian Federation, whose geological history has been conditioned by the interacting Pacific and Eurasian plates. Ancient geological structures of Asia and young structures of the Pacific Belt, that is the transit zone from continent to ocean, are present here.

The proposed programme comprises pre- and post-conference field tours, scientific and social programs,
rock, map, and publication displays, and trade exhibition. The program presents an opportunity for delegates to visit several famous large and unusual ore deposits of the Russian Far East and Pacific Rim.

FIELD EXCURSIONS

Trip 1: Dalnegorsk ore district: polymetallic (Pb, Zn, Ag) and boron skarns, tin-sulfide veins, and coastal belt granitoids. (Details: accommodation at a hotel in Dalnegorsk-town, 35 people, bus or plane (?) transportation).


Trip 3: Geology, magmatism, and gold deposits of South Primorye (Sergeevka) (Details: accommodation in the city of Nakhodka or at «Avangard» camping area, 35 people, bus transportation).

Trip 4: Gold deposits of the Russian Northeast "Kolyma Golden Ring" (Details: accommodation in the city of Magadan, 25 people, plane transportation).

Trip 5: Konder deposit: alkali-ultrabasic rocks of the Konder intrusion and the related platinum and gold placers. (Details: accommodation in Nelkan or Konder villages, 25 people, plane transportation).

32nd International Geological Congress,
Florence, Italy, August 20-28, 2004

In collaboration with and under the sponsorship of the IUGS

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From the Mediterranean toward a Global Renaissance
Geology, Natural Hazards and Cultural Heritage

The second circular for the next IGC is available on the website: http://www.32igc.org/

IAGOD has proposed several symposia and workshops.

International Union of Geological Sciences
The International Union of Geological Sciences (IUGS) is one of the largest, non-governmental, non-political, and non-profit making scientific organizations in the world. It addresses earth-science problems of broadly international scope through its own activities and those co-sponsored with other agencies. IUGS encourages the highest levels of international co-operation and participation in its activities, many of which deal increasingly with the Earth and human welfare. Since its founding in 1961, IUGS has been a member of ICSU (International Council for Science, http://www.icsu.org).

Activities
IUGS undertakes day-to-day work through its Commissions, Subcommissions, Task Groups, Joint Programs and its Initiatives. The Union is the scientific sponsor of the quadrennial International Geological Congress and advises and assists the organizers in formulating the scientific program for this event.

Commissions and their component subcommissions address topics requiring long-term study. Existing Commissions include Environmental Planning, Global Sedimentary Geology, History of Geological Sciences, Igneous and Metamorphic Petrogenesis, the handling of Geoscience Information, Stratigraphy, Systematics in Petrology, Geological Education and Training, and Tectonics.

Task Groups deal with topics needing immediate action or short-term studies. They are appointed directly by the Union and deal with: Decay Constants in Geochronology, Global Geosites, Global Continental Geochemical Baselines, Fossil Fuels and Public Affairs.
Joint Programs are sponsored by IUGS and other organizations. Existing programs in collaboration with UNESCO are: the International Geological Correlation Programme (IGCP), Geological Applications of Remote Sensing, and Mineral and Energy Deposit Modelling. The ICSU Scientific Committee on the Lithosphere (SCL) was born as an inter-Union initiative between IUGS and the International Union of Geodesy and Geophysics. Two new Initiatives were established by the IUGS Executive Committee in 2002: The Initiative on Medical Geology, and the Initiative on Geoindicators.

**Accomplishments of IUGS**

As the broadest ranging international forum for the geological sciences, IUGS has established an effective and highly respected global network for communicating across disciplines, across political and geographical boundaries, across levels and gaps of knowledge. This has led to countless examples of improved resolution of scientific problems, establishment of better standards and techniques, more enlightened definition of fields requiring future scientific inquiry - in short, the strengthening of the scientific base on which geological research rests and without which geoscience cannot be effectively applied toward improving human welfare.

**Find out more on** [http://www.iugs.org/](http://www.iugs.org/)

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IAGOD National Group of Tajik Republic (9 members)
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A. (TGG); Lutkov, Valery S. (GI TAS); Matveeva, Irina N. (GI TAS); Minaev, Vladislav E. (GI TAS); Revazov,
Boris A. (GI TAS); Fayziev, Abdoukhak R. (GI TAS).
Explanations: FHA: Focus Humanitarian Assistance, Dushanbe-Khorog; GI TAS: Geological Institute of the
Tajikistan Academy of Sciences, Dushanbe; KSU: Khorog State University, Khorog; MIMB: Ministry of Industry,
Mining Branch, Dushanbe; TGG: Tajikglavgeologia, Dushanbe.

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The next IAGOD Newsletter will be published in June/July of 2004

All contributions are welcome!
Please send to Nigel Cook (Nigel.Cook@ngu.no)

by 15th April 2004 at the latest

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