Welcome to the IAGOD e-newsletter for 2004-2005!

This is the first newsletter which will be sent out in digital form. It arrives later than originally planned, but we hope that you will agree that this gives the newsletter an attractive new format, especially the use of colour photographs.

The central feature of IAGOD’s activities in 2006 will be the 12th Quadrennial IAGOD Symposium in Moscow. On behalf of the local organising committee and IAGOD Council, we hope to see many of our members there.

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*International Association on the Genesis of Ore Deposits (IAGOD)*
*Society of Economic Geologists (SEG)*
*Society for Geology Applied to Mineral Deposits (SGA)*
*Department of Earth Sciences, Russian Academy of Sciences*
*Federal Agency of Mineral Resources, Ministry of Natural Resources of the Russian Federation*
*Moscow State University*

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MINEX initiative

UNDERSTANDING THE GENESIS OF ORE DEPOSITS
*TO MEET THE DEMANDS OF THE 21ST CENTURY*

12th QUADRENNIAL IAGOD SYMPOSIUM – 2006

MOSCOW
21-24 AUGUST 2006
Invitation!

Exploration for, and exploitation of mineral deposits provides one of the most foundations for human society. Society cannot be sustained without energy, metals, fertilizers etc., and our continued wealth and prosperity are intimately linked to our ability to use the resources available to us. Mankind is unlikely to be able, in the near future, to find realistic ways of synthesizing different commodities from air or ocean water, or to exploit resources on neighboring planets. Thus, we must rely on the resources within our home planet. Increasing consumer demand, the depletion of known resources, and the need to adhere to stricter regulation of environment and land-use, have meant that the exploration and mining industry is faced with increasingly tough challenges to identify and exploit remaining undiscovered or only partially characterized resources. All segments of the ore geology community need to build a partnership to overcome these challenges.

Concepts on the genesis of ore deposits are often believed to be just theories, but the growing volume and reliability of data to sustain models of ore-forming processes enables us to directly employ such models in prospecting for undiscovered ore deposits, including blind deposits. In the past two centuries, numerous bodies of multi-disciplinary data have been collected. At the same time, the growing tendency toward narrow specialization in science has impeded analysis and interpretation of the available information. To meet the ever-increasing demands, we need to think of better ways to incorporate existing and anticipated data into models for application in prospecting and exploration.

The 12th Quadrennial IAGOD Symposium – 2006 “UNDERSTANDING THE GENESIS OF ORE DEPOSITS to meet the demands of the 21st Century” is devoted to bringing together professionals in different fields of economic geology, geochemistry and mineralogy: academic researchers and experts, students, and mining and exploration company personnel. Join us in Moscow to share understanding and to define common goals for today and the future!

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Local Organizing Committee

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BHP Billiton Eurasia, LLC
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JSC "MMC "Norilsk Nickel" is one of the world's largest basemetal mining companies and the largest in the Russian Federation. The Company's production is based on the world class Ni-Cu-PGE deposits at Noril'sk and Pechenga. It is the world's largest palladium producer and is a leader in nickel and platinum production. In addition we produce significant amounts of copper and cobalt.

JSC "MMC "Norilsk Nickel" is also one of the world's oldest basemetal mining companies, producing for more than 50 years. The Company conducts extensive exploration throughout the Russian Federation for many types of ore deposits, including copper, gold, platinum group metals, nickel, molybdenum, titanium, silver and others.

JSC "MMC "Norilsk Nickel"
22 Voznesenskiy Per., Moscow, 125993 Russia.
Tel: (495) 797 82 14
Fax: (495) 797 82 39
E-mail: info@nornik.ru
Web-site: http://www.nornik.ru

Informational sponsor

MINEX (Mining and Exploration) initiative is the largest international communication and business development project aimed at promoting Investment opportunities in the mineral resources of Russia and the Commonwealth of Independent States. According to the resolution made by MINEX 2005 - Russia has a unique potential in just 15 years (by 2020) to become a world's leader in exploration and production of mineral materials. Over 350 directors of mining and exploration companies, strategic investors, government representatives, Russian and international banks, consultants (representing Russia, Georgia, Kazakhstan, Kyrgyzstan, Ukraine, Western Europe, Africa, Australia, Canada, South Korea, Japan and US) meet annually at the MINEX Forum in Moscow with the aim of stimulating exchange of new ideas and practical experiences. The MINEX committee is currently chaired by SRK Consulting - the international mining engineering consulting company and administered by Advantix Ltd - a UK-based business communications consultancy working with Russia and CIS.

MINEX-2006 forum will take place 5-6 October 2006
Sponsors are still invited to participate in organizing the special events during the Symposium. All the questions related with sponsorship should be addressed to

Dr. Sergei Cherkasov,
IAGOD LOC Executive secretary,
Vernadsky State Geological Museum of RAS,
11-2 Mokhovaya str., Moscow, 125009 Russia
e-mail: sergy@sgm.ru
tel. +7-(095)-203-4667
fax +7-(095)-203-5287

Registration & extended abstracts

Online registration of participants and information for those who wish to receive news related to the Symposium is available at the official website www.iagod.sgm.ru

If you plan to participate in the Symposium and to present one or more paper(s), your pre-registration should be followed by submission of an extended abstract in English.

All extended abstracts accepted by the Local Scientific Committee will be published on a CD, which will be made available to all participants. You can submit up to 4 pages of text, including inserted graphics (figures, diagrams, tables). The short abstracts will be published as a hard copy along with the Symposium program.

You may send your extended abstracts by e-mail in Microsoft Word format in a print-ready form. You may be asked to send your graphics as separate files.

The ultimate closing deadline for the extended abstracts is 31 March 2006.

Formatting requirements will be found on the conference website

Field trips

To participate in the field trips, except for the Ukraine excursion, which needs to be booked directly at http://ukriagod.kiev.ua/start-eng.htm, you should fill the registration form below and pay field trip fees. Registration and payment for all trips excluding Ukraine and Noril’sk is possible up until 30 April 2006 (subject to max number of participants). Cost of all trips but Ukraine covers accommodation, half board, transport expenses at the field trip site.

For participants outside Russia:
To pay field trips fees, you should complete the payment form and send it by fax +7-(095)-203-5287 or by e-mail: iagod@sgm.ru (filled and scanned). Another way to pay is a bank transfer to:

Deutsche Bank
Platz der Oktoberopfer 5
D-09599 Freiberg

Name of account: IAGOD c/o Thomas Seifert
Deutsche Bank Freiberg
Account No. 0576 090
Bank Code 870 700 24
IBAN: DE48 8707 0024 0057 6909 00
BIC (SWIFT-CODE): DEUTDEDB879
Details of payment: IAGOD Symposium Moscow 2006, name(s) of registrants, title of field trip.

For participants from Russia:

Please, send to iagod@sgm.ru bank details of your organization, and names of registered participants, and we will issue an invoice. Для российских участников: сообщите банковские реквизиты Вашей организации по электронной почте, и Вам будет выставлен счет на оплату регистрационных взносов. Если Вы оплачиваете регистрационные взносы с личного счета, Вы можете перечислить сумму в рублях, эквивалентную сумме регистрационного взноса по курсу ЦБ на день платежа по следующим реквизитам:

Получатель: Некоммерческая организация Фонд «Наука и будущее»
Почтовый и юридический адрес: 103009, Москва, ул. Моховая, д. 11, стр. 2, ГГМ РАН.
Расчетный счет: 40703810000000001340 в филиале ОАО «Автовазбанк» в г. Москва, К/сч. 30101810000000000670, БИК 044583670. ОГРН 1037739908942, ИНН 7703502952/770301001.
Предмет платежа: Регистрационный взнос IAGOD-2006, фамилия И.О. участника.

LOC will assist to obtain export permission for excursion samples (fees and charges not included in excursion fees.

**PRE-SYMPOSIA FIELD TRIPS**
*(12 – 20 August 2006)*

1. **Monchegorsk ore district (Murmansk region).**
   Cu-Ni sulfides, chromium, PGE deposits. Host rocks of layered Early Proterozoic intrusions in the central part of Kola Peninsula. Minimum number of participants – 6; maximum – 25.
   Leaders: Dr. Valery Smolkin (Vernadsky SGM RAS, Moscow), Dr. Yury Neradovsky (Geological Institute of Kola Scientific Center RAS, Apatity).
   **Participants are requested to arrive in Moscow by 9 a.m. on 12 August. For arrival on 11th of August hotel accommodation in Moscow may be arranged upon request (not included in fee).**

   12 August, Saturday. Flight Moscow-Murmansk, transfer to Apatity by car.
   13 August, Sunday. Visiting Geological Institute of Kola Scientific Center and Geological Museum. Lectures on geology and metallurgy of Kola Peninsula.
   14 August, Monday. Monchegorsk city. Field trip to Monchegorsk gabbro-anorthosite massive – new PGE occurrence and Sopchozero chromite deposit (dunite block of Monche-pluton).
   15 August, Tuesday. Layered Monche-pluton. Sulfide ores and rocks of lower part of the pluton. Lower zone and disseminated ores Mount Travyanaya, layered zone of Mount Kumuzhya, ore veins of Mount Nittis, nodular chromite ores, near-ore dykes’ system.
   16 August, Wednesday. Medium part of Monche-pluton. Ore layer 330 of Mount Sopcha, sulfide ore stockwork Nyud-II deposit, ‘critical’ horizon and Terrasa ore occurrence of Mount Nyud.
   17 August, Thursday. Upper part of Monche-pluton. Gabbroids of Mount Poaz, platinum-bearing reef (low-sulfide platinum-bearing type, host meta-gabbroids of Mount Vurechuaivench. Overlying meta-conglomerates and weathered crust.
   18 August, Friday. Chromite deposits of Umbarechenk-Imandra complex: Bol’shaya Varaka (open pit close to Apatity city) and Mound Devichya-Maryavr.
   19 August, Saturday. Kirovsk sity. Apatite-nepheline ores of Khibiny alkaline-syenite pluton. Visiting Central’ny mine (Ravsumchorr plato).
   20 August, Sunday. Transfer from Apatity to airport. Murmansk-Moscow flight.

   Cost: **Euro 1010** including flight Moscow-Murmansk-Moscow; **Euro 700** without airfare.
2. North Ladoga (south-west Karelia)
Gold, VMS, base metals, Sn and other deposits in Yalonvaary, Raakhe-Ladoga zone, Pitkyarantsky ore district. Minimum number of participants – 6, maximum – 25.
Leaders: Drs. V. Ivaschenko and O. Lavrov (Institute of Geology, Karelian Scientific Center of RAS, Petrozavodsk).
Participants are requested to arrive in Moscow by 12 a.m. on 13 August.
13 August, Sunday evening. Night train Moscow-Petrozavodsk.
14 August, Monday. Car transfer to Ladoga, with stops at outcrops of crystalline rock. Accommodation in Yanisyarvi hotel.
15 August, Tuesday. Transfer to Yanisyarvi Lake. Yalonvaary ore field. Geology and ores of south part of the Yalonvaary-Ilomatsi-Tulos greenstone belt. VMS Yalonvaary, porfirc Cu-Mo and Au-Te-W-Mo Yalonvaary deposits, Au-sulfide Khatunoya ore occurrence in shear zones.
16 August, Wednesday. Transfer southwards from Yanisyarvi Lake. Raakhe-Ladoga zone Pyakyulya Au occurrence, bimodal calc-alkaline magmatism, meta-turbidites, Au-As ores in shear zones.
Transfer to the area north of Sortavala town. Skarn base metal ore occurrences of western margin of Iokirantsky granite-gneiss dome. Pb-Zn-V Vaitasari occurrence, geology of Sortavala series, late-Svecofennian late-orogenic magmatism.
17 August, Thursday. Transfer to the area north of Impilakhhi village. Sn-base metal Kulismaiokskoe ore occurrence. Transfer to Pitkyaranta town area (north-east coast of Ladoga Lake). Sn-base metal Khopunvaara deposit.
18 August, Friday. Transfer to Sortavala town. Visiting Valaam Island, sightseeing (monastery), geological sites on the island. Transfer to Petrozavodsk by bus, accommodation in “Karelia” hotel.
19 August, Saturday. Visiting Geological Institute KSC RAS, Geological Museum, Kizhi Island.
20 August, Sunday. Train to Moscow.
Cost: Euro 860 including train Moscow-Petrozavodsk-Moscow; Euro 760 when the trip starts and ends in Petrozavodsk.

3. Central Urals (Sverdlovsk region).
Lithogenesis, metamorphism, and ore facies of VMS Central Urals deposits. Minimum number of participants – 6, maximum – 25.
Leaders: Dr. V. Maslennikov, I. Zhukov (Institute of Mineralogy, Chelyabinsk Scientific Center of Urals Department of RAS, Miass). Participants are requested to arrive in Moscow by 10 a.m. on 13 August. For arrival on 12th of August hotel accommodation in Moscow may be arranged upon request (not included in fee).
13 August, Sunday. Flight Moscow-Yekaterinburg. Accommodation in “Bol’shoi Ural” hotel.
14 August, Monday. Transfer to Serov town, stop in Nizhnii Tagil for a lunch.
15 August, Tuesday. Cu-Zn VMS Valentorskoys deposit (open pit), volcanic and ore facies.
16 August, Wednesday. Cu-Zn VMS Tarnierskoye deposit (open pit), metamorphic and ore.
17 August, Thursday. Cu-Zn VMS Novo-Shemurskoye deposit (open pit), volcanic and ore facies.
18 August, Friday. Transfer to Yekaterinburg city, stop at the open pit and mine dumps of Levikhinskoye deposit. Accommodation in “Akademicheskaya” hotel.
19 August, Saturday. Visiting Rezh town, open pit of “Safianovskaya Med’” company.
20 August, Sunday. Visit to Museum of Mining Institute and Mineralogical Museum. Flight Yekaterinburg-Moscow.
Cost: Euro 940 including airfare Moscow-Yekaterinburg-Moscow; Euro 640 without airfare.

4. Noril’sk ore district (Taimyrskii national district of Krasnoyarsk region). Please note that the deadline for registration and payment for this excursion is 15 March 2006.
Geology, mineralogy, and genesis of Pt-Cu-Ni sulfide ores of Noril’sk ore district, and host rocks of intrusive Noril’sk complex. Minimum number of participants – 8, maximum – 20.
Leaders: Dr. V. Distler (IGEM RAS, Moscow), Mr. A. Torgashin (Chief geologist of Noril’sk Nickel Mining-Metallurgical Industrial Center).
13 August, Sunday. Departure from Moscow in the evening. Participants are requested to arrive in Moscow not later than 12 a.m. on 13 August. For arrival on 12th of August hotel accommodation in Moscow may be arranged upon request (not included in fee).
14 August, Monday. Arrival in Noril’sk, accommodation in the ‘Noril’sk’ hotel. Meeting with heads of Mining & Metallurgy Direction and Geological surveys. Overview excursion through Noril’sk, Talnakh, visiting mines.
15 August, Tuesday. Open pit ‘Medvezhii Ruchei’ (Noril’sk-1 deposit). Museum of history of Noril’sk industrial district development.
16 August, Wednesday. Underground mines Oktyabrskii, Komsomol’skii, and Taimyrskii of Oktyabrskoye and Taimyrskoye deposits. (by groups 7 persons each). Ore dumps.
17 August, Thursday. Underground mines Oktyabrskii, Komsomol’skii, and Taimyrskii of Oktyabrskoye and Taimyryskoe deposits. (by groups 7 persons each). Ore dumps.
18 August, Friday. Talnakh town. Visit to “Noril’skgeologiya” company core storage. Museum of “Noril’skgeologiya”; meeting with leading geologists.
19 August, Friday. Talnakh town, Field trip to the outcrop of Noril’sk-2 intrusion.
20 August, Sunday. Morning flight Noril’sk-Moscow.

Cost: **Euro 1920** including airfare Moscow-Noril’sk-Moscow; **Euro 1100** excluding airfare.

Ukraine field trip. Starts and ends in Kiev, 12-20 August 2006. All the details including registration and guidelines for payment are available at [http://ukriagod.kiev.ua/start-eng.htm](http://ukriagod.kiev.ua/start-eng.htm)

**POST-SYMPOSIA FIELD TRIPS**
(25 August – 2 September 2006)

6. Southern Urals (Bashkorkostan).
Geology, zonality, and genesis of VMS deposits of Southern Urals. Minimum number of participants – 8, maximum – 25.
Leader: Dr. I. Seravkin (Institute of Geology Ufa Scientific Center of RAS, Ufa)

- 25 August, Friday. Flight Moscow-Ufa.
- Lecture “VMS deposits of Southern Urals”.
- 26 August, Saturday. By car: Ufa-Beloretsk-Miss-Uchaly. Stops for observation of Riphean deposits and serpentinite mélangé of Major Urals Fault zone.
- 27 August, Sunday. Uchaly ore mining and processing enterprise; Cu-Zn VMS deposits Uchaly (open pit, mine) and Molodyozhnoye (open pit).
- 28 August, Monday. By car: Uchaly-Magnitogorsk-Sibai. Stop: observation of volcanogenic ore hosting section (Karakaily streem).
- 29 August, Tuesday. Visit of geological prospecting enterprise. Sibaiskoe and Kamanganskoe Cu VMS deposits (open pits).
- 30 August, Wednesday. Transfer Sibai-Gai. Stops at Au-base metals VMS Balta-Tau deposit (open pit). Open pits (numbers 1,2,3) of Cu VMS Gai deposit. Night in a hotel in Gai town.
- 31 August, Thursday. Mine of Gai deposit. Transfer Gai-Letnee. Night in a hotel.
- 1 September, Friday. Transfer Letnee-Ufa.
- 2 September. Flight Ufa-Moscow. Arrival in Moscow before noon.

Cost: **Euro 880** including airfare Moscow-Ufa-Moscow; **Euro 730** without airfare.

7. Onega ore district (Central and eastern parts of Karelia).
Minerageny of Onega ore district – deposits of chromium, PGE, titanomagnetite, and shungite. Minimum number of participants – 6, maximum – 25.
Leader: Dr. A. Golubev (Institute of Geology, Karelian scientific center of RAS, Petrozavodsk).

- 25 August, Friday. Night train Moscow-Petrozavodsk.
- 26 August, Saturday. Transfer by bus Petrozavodsk-Pudozh, accommodation in a hotel.
- 27 August, Sunday. Aganozero chromite deposit of Burakovskii layered pluton.
- 28 August, Monday. Pudozhgorskoye titanomagnetite ore deposits.
- 29 August, Tuesday. Dhungite deposits of Onega through. Transfer to Petrozavodsk, accommodation in “Karelia” hotel.
- 30 August, Wednesday. Visit to core storage. Core from Burakovskii pluton.
- 31 August, Thursday. Visit to Institute of Geology, Karelian scientific center of RAS. Kizhi Island.

1 September, Friday. Train Petrozavodsk-Moscow. Arrival in Moscow before 11am.

Cost: **Euro 1015** including train Moscow-Petrozavodsk-Moscow, **Euro 900** when participant arrives to Petrozavodsk at his own.

8. Devonian diamond placer of Central Ural (Perm Region).
Minimum number of participants – 4, maximum - 10.
Leaders: Dr. A.V.Lalomov (Institute of Geology of Ore Deposits, IGEM RAS)
Dr. V.A.Naumov (Institute of Natural Sciences, Perm),
Dr. O.B. Naumova (Perm State University)
25 August, Friday evening. Departure from Moscow by train.
26 August, Saturday. Arriving to Perm (evening), accommodation in hotel Ural.
27 August, Sunday. Excursion to Kungur Cave and Belogorsky monastery. Return to Perm.
28 August, Monday. Transfer to Solikamsk; excursion to salt mine "Silvinit"; accommodation in hotel of town Solikamsk.
29 August, Tuesday. Transfer to Krasnovishersk district of Perm Region. Visiting of mine "Uralalmaz" (Uraldiamond) and concentrating factory; return to Perm and accommodation in hotel Ural.
30 August, Wednesday. Departure by train to Moscow.
31 August, Thursday (morning). Arriving to Moscow.

Cost: Euro 890 including railroad round-trip ticket Moscow-Perm-Moscow; Euro 745 without the tickets.

Disclaimer and cancellation policy

All the field trips’ participants take part in the trips at their own risk. It is essential that they obtain and carry appropriate medical insurance policies at their own responsibility.

Cancellation of participation in the field trips is possible before 15th of June 2006 with 100% refund. No refund will be made after that date.

Deadlines and payments

Registration of participants is open at www.iagod.sgm.ru registration page
Submission of extended abstracts – the deadline is extended until 15 March 2006
Noril’sk excursion registration and fees – 30 March 2006
Field trips registration and fees (excluding Noril’sk and Ukraine) – 30 April 2006
Please, note that number of participants in the field trips is strictly limited. The field trip can be cancelled due to insufficient number of participants with 100% refund.

Low rate registration fees - 31 May 2006
Abstracts will only be published if the registration fee is paid by the 31 May 2006 deadline
Late and on-site registration is possible, but at higher rates.

Visas: In accordance with Russian regulations, we can apply for visas not earlier than 45 days before entering the country. Additional information for visa applications will be requested from participants at the end of May 2006.

Hotel booking: LOC will arrange accommodation in the RAGS hotel only – at the conference venue. Participants will be asked for their requests for this specific hotel booking starting from 10 May 2006. Participants wishing to stay at other hotels are responsible for making the bookings themselves.
Full details of the social program for participants and accompanying persons will be announced by the end of May 2006.

| Registration fees     | Low rate before 31.05.06 | After 31.05.2006 and on-site |
|-----------------------|--------------------------|------------------------------|
| IAGOD/SGA/SEG/AEGE members | 270                      | 350                          |
| Non-members           | 320                      | 400                          |
| Accompanying persons  | 150                      | 200                          |

50% discount is granted to students.

Cancellation policy

Participation in the Symposium can be cancelled before 15 June with 50% refund (for the field trips – 100%). There will be no refund after this date.

For Participants outside Russia:
To pay registration and field trips fees, you should fill the Payment form (see attachment) and send it by fax +7-(095)-203-5287. Another way to pay is a bank transfer to:

Deutsche Bank
Platz der Oktoberopfer 5
D-09599 Freiberg

Name of account: IAGOD c/o Thomas Seifert
Deutsche Bank Freiberg
Account No. 0576 090
Bank Code 870 700 24
IBAN: DE48 8707 0024 0057 6090 00
BIC (SWIFT-CODE): DEUTDEDB879
Details of payment: IAGOD Symposium Moscow 2006, name(s) of registrants.

For participants from Russia:

please, send to iagod@sgm.ru bank details of your organization, and names of registered participants, and we will issue an invoice. Для российских участников: сообщите банковские реквизиты Вашей организации по электронной почте, и Вам будет выставлен счет на оплату регистрационных взносов. Если Вы оплачиваете регистрационные взносы с личного счета, You можете перечислить сумму в рублях, эквивалентную сумме регистрационного взноса по курсу ЦБ на день платежа по следующим реквизитам:

Получатель: Некоммерческая организация Фонд «Наука и будущее»
Почтовый и юридический адрес: 103009, Москва, ул. Моховая, д. 11, стр. 2, ГГМ РАН.
Расчетный счет: 40703810000000001340 в филиале ОАО «Автовазбанк» в г. Москва, К/сч.
30101810000000000670, БИК 044583670. ОГРН 1037739908942, ИНН 7703502952/770301001.
Предмет платежа: Регистрационный взнос IAGOD-2006, фамилия И.О. участника.

Location and accommodation

The event will take place at the Russian Academy of State Service under the auspices of the President of Russian Federation (for pictures see http://www.rags.ru/about.shtm, text in Russian).

The Academy is located next to Yugo-Zapadnaya metro station, 25 minutes by metro to Red Square. It has two university buildings and two hotels where participants will be accommodated. Current prices are from € 32 per night for a single room (For Russian citizens – from € 23). Please, note that the prices are not fixed yet, and may change by August. Details regarding payment for accommodation will follow in May 2006 when prices are confirmed.

Those seeking accommodation in luxury hotels in the city centre can make their arrangements through http://www.moscow-hotels.net

Social program

Participants will have an opportunity to visit famous Moscow museums, including museums of Kremlin - Diamond Fond, Oruzhainaya Palata (Weapon Hall); Museums of Art – Pushkin Art Museum and Tretiakov Gallery; geological museums (Vernadsky State Geological Museum, Fersman Mineralogical Museum, Museum of Earth MSU). A special program will be arranged for accompanying persons.

Booking of theatre tickets will be open at the Symposium website in May, 2006. Icebreaker and Farewell parties.
IAGOD

International Association on the Genesis of Ore Deposits

The Chief Treasurer
Dr. Thomas Seifert
Department of Economic Geology
Institute of Mineralogy
TU Bergakademie Freiberg
Brennhausgasse 14
D-09596 Freiberg
Germany

Payment form on the
12th Quadrennial IAGOD Symposium in Moscow, 21-24 August 2006

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Credit Card: All charges will be in Euro.

I authorize the “International Association on the Genesis of Ore Deposits” to charge the TOTAL AMOUNT DUE (Registration Fee and Excursions) in Euro ____________ to my

□ Visa □ MasterCard

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Signature __________________________________ Date _______________
IAGOD NEWSLETTER 2004-2005

Additional information is available at www.iagod.sgm.ru
After registration you will be receiving a monthly newsletter. All the questions related with the Symposium should be directed to the Local Organizing Committee.

Contacts:

Please, feel free to ask any questions related to the Symposium:

Mrs. Olga Koshel - LOC Secretary
Vernadsky SGM RAS, 11-2 Mokhovaya str., Moscow, 125009 Russia
Fax: +7-(495)-203-5287
Phone: +7-(495)-203-4667
E-mail: iagod@sgm.ru

to the field trips:

Dr. Valery Smolkin – responsible for the field trips
Fax: +7-(495)-203-5287
Phone: +7-(495)-203-4667
E-mail: vsmolkin@sgm.ru

Report: INTERIM IAGOD CONFERENCE, 1-20 September 2004, Vladivostok, Russia

Metallogeny of the Pacific Northwest: “Tectonics, Magmatism and Metallogeny of Active Continental Margins”

The conference was attended by 162 persons, among them about 130 Russian participants from the scientific and industrial organizations of Blagoveschensk, Birobidzhan, Vladivostok, Irkutsk, Khabarovsk, Magadan, Moscow, Novosibirsk, Petropavlovsk-Kamchatsky, St Petersburg, Ulan-Ude, Yakutsk, and 32 foreign specialists from Australia, Austria, Canada, Great Britain, Germany, Indonesia, Italy, Mongolia, USA, South Korea and Japan.

The conference programme included 8 scientific sessions and one subsection. The greatest amount of reports was delivered within the sessions ‘Geodynamics and metallogeny’, ‘Geochemical and geodynamic types of granites and their ore mineralization’; and ‘Ore deposits: geological setting, structural features, ore composition, and genesis’.

The Plenary Session featured the following invited keynote reports:

1. Intraplate magmatism and metallogeny exemplified by the Mongol-Okhotsk belt
   M.I. Kuzmin, S.I. Dril, S.A. Tatrnikov, A.M. Spiridonov, Zh.V. Seminsky, V.G. Belichenko

2. Gold-platinoid mineralization in carbonaceous rocks of the Khanka massif
   A.I. Khanchuk, V.P. Molchanov, L.P. Plyusnina

3. First U-Pb zircon SHRIMP and Re-Os arsenopyrite dating of granitic magmatism and gold mineralization from the Muruntau district and implications on Muruntau-style deposits
   R.Seltmann and CERCAMS team (IAGOD Keynote Lecture)

4. The rebirth of gold mining in Sub-Saharan Africa
   M.P. Martineau (SEG Distinguished Lecture; sponsored by SEG).

The following pre- and post-symposium field excursions were attended by interested participants:

Trip B: ‘The Kolyma Gold Ring’. Leader: N. Goryachev (North-East Complex Research Institute, Magadan, Russia);

Trip D: ‘Dalnegorsk ore district’. Leaders: A. Kokorin and G. Vasilenko (Far East Geological Institute, Vladivostok, Russia);

Trip I: ‘Miocene-Quaternary center of magmatic, volcanic, hydrothermal, and metallogenic activity in South Kamchatka’. Leaders: V.M. Okrugin and M.E. Zelensky (Institute of Volcanology, Petropavlovsk-Kamchatsky).
At the beginning of the meeting the following conference publications were issued and can now be ordered from IAGOD (see also IAGOD Publications):

1. Proceedings volume with the extended abstracts of the oral and poster contributions “Tectonics, Magmatism and Metallogeny” by A.I. Khanchuk et al. (2004). This volume was distributed to all registered conference participants.

2. Excursion Guidebook (including description of 9 excursions representative for the Russian Far East) on ‘Metallogeny of the Pacific Northwest (Russian Far East): Tectonics, Magmatism and Metallogeny of Active Continental Margins’, edited by A.I. Khanchuk, G.A. Gonevchuk and R. Seltmann (2004). The guidebook contains detailed descriptions of many geological objects of the Far East of Russia. It is of interest for a wide range of geologists.

The participants enjoyed also a manifold programme of social and cultural events, including ice-breaker party, banquet reception, sightseeing tours around Vladivostok and a nightly boat cruise through the harbor.

Chairman Organizing Committee: Alexander I. Khanchuk (IAGOD President), Corresponding Member of Russian Academy of Sciences, Far East Geological Institute, Vladivostok, Russia

Scientific Program Secretary: Dr. Galina A. Gonevchuk

Contributed by Reimar Seltmann

Glacier clawing into the crater lake of Mutnovskoe volcano, Kamchatka.

Call for volunteers:

IAGOD is your association – volunteers are always needed to become involved in society activities, national groups, working groups and commissions and IAGOD council. Would you like to get involved? Please contact Nigel Cook, IAGOD SG (n.j.cook@nhm.uio.no)
Sulphur precipitation and steam fumaroles in crater of Mutnovskoe volcano, Kamchatka

Report: 8th Biennial Meeting of the Society for Geology Applied to Ore Deposits

IAGOD (International Association on the Genesis of Ore Deposits) co-sponsored the 8th Biennial Meeting of the Society for Geology Applied to Ore Deposits (SGA), Beijing, China, August 20th-23rd 2005, and contributed actively to the success of the scientific program. IAGOD members benefited from registration fees in the "member" category. A reciprocal benefit has been negotiated in return to SGA members attending the 12th Quadrennial IAGOD-2006 meeting in Moscow. IAGOD convened two full-day oral & poster sessions, both well attended by about 50-80 meeting participants, and sponsored by the International Geoscience Program: Session 12 (12 oral papers, 14 posters) "Geodynamics and metallogeny of the Altai Orogen" (IGCP-473), and Session 13 (7 oral papers, 16 posters) "Metallogeny of the Au-Ag-Se-Te mineralized systems" (IGCP-486). Both sessions featured progress in IAGOD-coordinated research cooperation in Transeurasian ore provinces.

R. Seltmann and N.J. Cook were members of the organising committee for the SGA meeting on behalf of IAGOD. Extended abstracts of these two sessions were published in the proceedings volume as chapters 12 (pp. 1293-1375) and 13 (pp. 1379-1454), respectively. Publication of selected papers is under preparation in Special Issues of Journal of Asian Earth Sciences and Ore Geology Reviews, respectively.

A highlight of the IAGOD contribution was the jointly organized SEG-IAGOD pre-meeting field trip FT04 "Copper and Gold deposits of Mongolia", enjoyed by a group of 24 participants.
IAGOD publications

To order from this list, please copy and send to:
Dr. R. Seltmann, CERCAMS, Dept. Mineralogy, Natural History Museum, Cromwell Road, London SW7 5BD, UK, Phone: +44 207 942 5042, Fax: +44 207 942 6012, E-mail: r.seltmann@nhm.ac.uk

The price of publications listed below includes shipping and packaging; upon request express delivery charges to be added

Guidebook Series:

- Ore-Bearing Granitoids of Sikhote Alin and Related Mineralization (1998), incl. separate Abstracts Volume
  Price £30
  No. of Copies: ________

- Au, Ag and Cu Deposits of Uzbekistan (1999); available only on CD-ROM.
  Price £30
  No. of Copies: ________

- Granitoids and Related Ore Deposits of the Urals (2000)
  Price £30
  No. of Copies: ________

- Paleozoic Geodynamics and Gold Deposits in the Kyrgyz Tien Shan (2001)
  Price £40
  No. of Copies: ________

- Mao et al. (2003) Tectonic Evolution and Metallogeny of the Chinese Altay and Tianshan
  Price £50
  No. of Copies: ________

- Metallogeny of the Pacific Northwest, Russian Far East (2004)
  Price £50
  No. of Copies: ________

- Gold-Silver-Telluride Deposits, South Apuseni Mts., Romania (2004)
  Price £50
  No. of Copies: ________

- Geodynamics and Metallogeny of Mongolia (2005) **NEW!!!**
  Price £50
  No. of Copies: ________

Monographs:

- Seltmann et al. (1994) Metallogeny of Collisional Orogens
  Price £40
  No. of Copies: ________

- Shatov et al. (1996) Granite-related Ore Deposits of Central Kazakhstan (on CD-ROM)
  Price £50
  No. of Copies: ________

- Kremenetsky et al. (2000) Ore-Bearing Granites of Russia and Adjacent Countries
  Price £40
  No. of Copies: ________

- Khanchuk et al. (2004) Tectonics, Magmatism and Metallogeny of Active Continental Margins.
  Proceedings of Extended Abstracts of the IAGOD Symposium on Metallogeny of the Russian Far East
  Price £40
  No. of Copies: ________

Maps (digital map versions are on CD-Rom in Corel Draw v. 9-11):

- Shatov et al. (2001-2004) Mineral deposits map of the Southern Urals, Scale 1 : 1 000 000
  Price £60.- (hardcopy)
  Price £70.50 (CD, incl. VAT 17.5%)
  No. of Copies: ________

- Seltmann et al. (2001-2004) Mineral Deposits map of Central Asia, Scale 1 : 1 500 000
  Price £80.- (hardcopy)
  Price £94.- (CD, incl. VAT 17.5%)
  No. of Copies: ________

- Bakirov et al. (2001-2004) Metallogenic map of Kyrgyzstan, Scale 1 : 1 000 000
  Price £40.- (hardcopy)
  Price £47.- (CD, incl. VAT 17.5%)
  No. of Copies: ________

- Nikonorov et al. (2000) Map of Mineral Resources of the Kyrgyz Republic, Scale 1 : 1 000 000
  with Explanatory Notes and Deposits Catalogue (map as JPG file; 76p. notes and tables in MS Word)
  Price £40.- (hardcopy)
  Price £47.- (CD, incl. VAT 17.5%)
  No. of Copies: ________

- Seltmann et al. (2005) Explanatory Notes of AV/MapInfo GIS package “Mineral Deposits of Central Asia” (PDF)
  Price £60.-
  No. of Copies: ________

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Editorial - Publishing in the digital era

Just how did we ever survive without the Internet? – without word processors to type and retype our manuscripts, or without e-mail that gives us almost instant access to our peers worldwide? All of us are now almost totally reliant on these tools to achieve our goals as scientific researchers, or as mining and exploration personnel. The past decade has witnessed a real revolution in the way we do things and the speed at which we are able to do them. These tools may have opened up so many opportunities and given us freedoms that previous generations were unable to enjoy, but at the same time, they have presented the scientific community with a whole new set of challenges. As the pace of change continues to increase, many of the changes need to be confronted and discussed.

Although fully electronic journals (i.e., those without paper analogues) have yet to make a major impact in the field of ore deposits, online editions of journals are now, for many of us at least, the main way we access contemporary literature. Visits to the library are, accordingly, becoming rather rare. In the case of many journals, papers are published online several months before hard copy arrives in the library (that’s if your library is one of those still taking the paper copy of course!). A paper set to appear in a journal volume to be issued in 2006 may be published online in 2005 – so what is the real publication date? In addition, online versions may deviate from the paper version – colour illustrations are available for free in the online version of *Ore Geology Reviews*, for example, yet not in the paper version. The technology already exists for the online journal to incorporate more complex images – 3D rather than 2D images, for example (think of the potential this offers for mineral deposit models or crystal structures!), raising the question of which version (paper or digital) is the ‘proper’ version?

Taking this further, it is also fully possible for online papers to be corrected, modified and otherwise updated as further results become available. This very idea fills many of with horror, yet there is a certain argument in favour of preventing the student of tomorrow losing time with publications that were redundant shortly after they were published.

Another theme that should concern anyone publishing their results is the citation of websites. This is now becoming commonplace, especially in the field of ore geology. Authors have found that citation of web-based information on mineral deposits is a convenient way to quote relevant recent exploration data, tonnage and grade statistics and other information not otherwise readily found in the public domain. Many mining companies now publish copious information on their websites and this trend is to be very much welcomed, as the published-to-web statistical data, maps, photographs and descriptions can be a superb source of up-to-date information. The problem, however, is that this web-based information can rapidly be lost, as the paged are updated or moved, or often closed altogether as the companies move on to other exploration areas, or are taken over, merged or simply no longer exist. Not infrequently, the website is no longer available by the time the manuscript which cites it has been submitted for publication. Some publishers may be reluctant to include such references - and rightly so. Authors should check if the information is not available elsewhere (in an unpublished company report, for example) and, in any case, should always provide the date on which the website had been accessed.

The Internet places a huge amount of information at the fingertips of a large part of humanity and it is really encouraging to see how net access is becoming increasingly available to those in the world’s poorer countries. As welcome as this development is, however, it throws up at least two other issues. Firstly, there is quality control of electronic information. Unfortunately, among the volume of information out there in cyberspace – interspersed with a great deal of excellent authoritative information, there are also a large number of websites that contain content that is less than accurate, and in some cases, just plain wrong or misleading. Freedom of expression is a fundamental human right, but the mixtures of pseudoscience and propaganda to be found on the net, can be a real trap for the students of tomorrow. A second issue follows on from the extraordinarily rapid growth of the Internet – the sheer number of dead ends, old sites (available in updated form elsewhere) and links that don’t work. I end this editorial with a
personal plea to everyone in the ore geology community to check their own websites, and especially links, and ensure that current, correct URL addresses are in place.

Ore Geology Reviews

Report of the Editor-in-Chief, November 2005

1. Editorial board

A team of 21 Associate Editors have served Ore Geology Reviews in 2004-2005:
- Fábio Ramos Dias de Andrade (Instituto de Geociências, University of São Paulo, Brazil)
- Greg B. Arehart (University of Nevada, Reno, NV USA)
- Frank P. Bierlein (University of Western Australia, Crawley, WA Australia)
- Kamen Bogdanov (Sofia University "St. Kliment Ohridski", Sofia, Bulgaria)
- Cristiana L. Ciobanu (South Australian Museum, Adelaide, SA, Australia)
- Charles Cunningham (USGS, Reston VA, USA) (*resigned September 2005)
- Hans Albert Gilg (Technische Universität München, München, Germany)
- Ian Graham (Australian Museum, Sydney, NSW, Australia) (*new February 2005)
- Khin Zaw (University of Tasmania, Hobart, Tas, Australia)
- Stephen Kesler (University of Michigan, Ann Arbor MI, USA) (*resigned November 2005)
- Ingrid N. Kigai (IGEM RAS, Moscow, Russia)
- Jaroslav Lexa (Geological Survey of Slovak Republic, Bratislava, Slovak Republic)
- Jingwen Mao (Chinese Academy of Geological Sciences, Beijing, China)
- Eric Marcoux (Université d'Orléans, Orléans, France)
- Roland K.W. Merkle (University of Pretoria, South Africa)
- Yuanming Pan (University of Saskatchewan, Saskatoon, Sask., Canada)
- Stephen M. Rowins (The University of British Columbia, Vancouver, B.C., Canada)
- James A. Saunders (Auburn University, Auburn University, AL, USA)
- Reimar Seltmann (Natural History Museum, London, U.K.)
- Thomas Wagner (Universität Tübingen, Tübingen, Germany) (*new October 2004)
- Alexander Yakubchuk (Gold Fields International Services Ltd., Oxford, U.K.)

2. Content of Ore Geology Reviews volumes 24-27 (2004 and 2005)

Volume 24, Issues 1-2, Pages 1-167 (January 2004) – Special issue ‘Ores and organic matter’ (Edited by R.M. Coveney Jr. and J. Pasava) 8 papers plus preface
Volume 24, Issues 3-4, Pages 169-372 (March 2004) – Special issue ‘Metamorphic processes in ore formation and transformation: A thematic series of papers’ (Edited by N.J. Cook and B. Marshall) 7 papers plus preface
Volume 25, Issues 1-2, Pages 1-173 (August 2004) 6 regular papers
Volume 25, Issues 3-4, Pages 175-334 (October 2004) 8 regular papers, 1 discussion/reply
Volume 26, Issues 1-2, Pages 1-185 (March 2005) – 8 papers, 1 reply, 1 discussion, 1 book review.
Volume 26, Issues 3-4, Pages 187-388 (July 2005) – 8 papers, 1 book review.
Volume 27, Issues 1-4, Pages 1-350 (November 2005) - Special Issue on Geodynamics and Ore Deposit Evolution in Europe (D. Blundell, N. Arndt, P.R. Cobbold, C. Heinrich, eds.).

3. Science Citation Index

ISI Web of Knowledge - journal citation reports for 2003 and 2004 were as follows.

ORE GEOLOGY REVIEWS: 1.528; 1.041

Other journals in the field of mineral deposits had the following scores:
MINERALIUM DEPOSITA: 1.969; 1.602
ECONOMIC GEOLOGY 1.448; 1.408
RESOURCE GEOLOGY 0.824; 0.515
GEOLOGY OF ORE DEPOSITS 0.456; 0.515

4. Submission of regular manuscripts

In 2005, 47 regular manuscripts have been submitted, slightly more than in 2003 (43) or 2004 (45).

Of the 132 manuscripts submitted in the past three years:
48 manuscripts are published or in press;
36 manuscripts remain under revision or re-revision by the authors;
15 manuscripts remain under review;
27 manuscripts have been rejected;
9 manuscripts have been withdrawn by the authors, or were found to be unsuitable for the journal.

In addition to the above, six papers originally destined for a special issue on ‘Ore deposits of the High-tech metals’; and a series of four papers ‘Industrial Minerals Deposits’, are accepted and in press.

A geographical breakdown of the 132 ‘regular manuscript submissions is shown on the pie diagram. This is based on the subject matter of the individual papers - nor the authorship, except in cases where the theme of the paper is ‘generic’ or global in scope):

5. Special issue projects

The following special issue projects were completed in 2005:
1. Geodynamics and Ore Deposit Evolution (Blundell, Arndt, Heinrich, Cobbold) published as volume 27.
2. Special issue on ‘Placer deposits’ (Els, Eriksson) is in press – to be published in 2006.

The following special issue projects will be sent to press in December 2005/January 2006:
1. Ore deposits of South China (Khin Zaw, Peters, Cook)
2. Ore deposits of the Quadrilatero Ferrifero, Brazil (Vial, Groves, Cook)

A number of other Special Issue projects are in various stages of preparation:
1. Papers presented at the IAGOD Interim Meeting, Vladivostok (Seltmann, Yakubchuk, Khanchuk).
2. Papers presented at the ICAM 2004 meeting, Brazil (Andrade, Gilg, Merkle).
3. Non-sulphide zinc deposits, Proceedings of Sardinia Workshop (Gilg, Boni, Cook).
4. ‘Ore forming processes associated with mafic and ultramafic rocks - IGCP-479 (Economou- Eliopoulos, Garuti, Mungall).

6. Review and publication time

Ore Geology Reviews does not offer ‘fast-track’ publication and the average time from submission to publication remains relatively long (average 15.5 months). Review times vary depending on the length and theme of manuscript, and currently average 3.3 months (marginally less than in 2004). The average length of submitted articles, and increased difficulties in locating suitable and willing reviewers, are the main reasons for these lengthy review times. Feedback from authors indicates, however, that the majority appreciate a detailed review, even if it takes longer.

Ore Geology Reviews will commence with online submission/review in April 2006.

Nigel J. Cook
| Position                  | Person          | Country                      | e-mail address                                      |
|--------------------------|-----------------|------------------------------|-----------------------------------------------------|
| President                | A. I. Khanchuk  | Russia                       | director@fegi.ru                                    |
|                          |                 | Far East Geological Institute, FEB RAS, 159, Prospekt 100-letiya, Vladivostok - 6900022, Russia. Tel. (+7) 4232 31-8323; Fax (+7) 4232 31-7847 |
| Past President           | E. Hammerbeck  | Republic of South Africa     | ehammerb@geoscience.org.za, heder@icon.co.za        |
|                          |                 | Council for Geoscience, Private Bag X112, Pretoria 0001, South Africa. Tel. (+27) 12-841 1130; Fax (+27) 12-841 1140 |
| Honorary Past President  | I. R. Plimer    | Australia                    | ianrp@unimelb.edu.au                                 |
|                          |                 | University of Melbourne, Department of Geology, Parkville, Victoria 3052, Australia Tel (+61) 3-9344 6520; Fax (+61) 3-9344 7630 |
| First Vice President     | N. Bortnikov    | Russia                       | bortnikov@igem.ru                                   |
|                          |                 | IGEM RAS, Staromonetny per. 35, Moscow 109 017, Russia Tel (+7) 095-2308 244; Fax (+7) 095-2302 179 |
| Second Vice President    | Mao Jingwen     | China                        | jingwenmao@263.net                                  |
|                          |                 | Institute of Mineral Deposits, CAGS, 26, Baiwanzhuang Road, Beijing 100037 Tel. (+86) 10 6832 7333, Fax (+86) 10-6831 0894 |
| 1st Vice President at Large | V. Shumlyanskyy | Ukraine                      | shum@uprotel.net.ua                                 |
|                          |                 | Intitute of Fundamental Studies of the Ukrainian Scientific Association, P.O. Box 291, 01001, Kyiv-01, Ukraine Tel/Fax (+380) 44 235 6983 |
| 2nd Vice President at Large | O. Gerel     | Mongolia                      | gerel@must.edu.mn                                   |
|                          |                 | Mongolian University of Science and Technology, Department of Geology and Mineralogy, P.O. 46, Box 520, 210646 Ulaanbaatar, Mongolia Tel. (+976) 11-326 425, -324 500; Fax. -324 121, -312291 |
| Secretary General        | N. J. Cook      | Norway                       | n.j.cook@nhm.uio.no                                  |
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| Chief Treasurer          | T. Seifert      | Germany                      | thomas.seifert@mineral.tu-freiberg.de               |
|                          |                 | TU Bergakademie Freiberg, Department of Economic Geology, Institute of Mineralogy Brennhausgasse 14, D-09596 Freiberg, Germany Tel. (+49) 3731 39-35 27, -26 62; Fax (+49) 3731 39-26 10 |
| Publication Manager      | R. Seltmann     | United Kingdom                | R.Seltmann@nhm.ac.uk                                |
|                          |                 | Natural History Museum, Dept. of Mineralogy, Cromwell Road, London SW7 5BD, UK Tel: (+44) 207- 942 5042; Fax (+44) 207 942 6012 |
Profiles of IAGOD council members:

**Alexander Khanchuk (President)**

Professor Alexander Khanchuk (born 1951) has had a long career with the Far East Geological Institute (FEGI) of the Far Eastern Branch of Russian Academy of Sciences (FEB RAS), which he started as a probation student after graduation from the Lvov State University in 1976. Before becoming the Director of FEGI in 1993, he worked as junior and senior researchers, chief of regional geology and tectonics laboratory, and deputy director for science. Since 2001 Prof. Khanchuk, after being elected the Vice-President...
of the Far Eastern Branch of RAS, has combined two positions, FEB RAS Vice-President and FEGI Director. His PhD (1982) and Doctorate (1993) projects described regional geology, tectonics, and metallogeny of the Russian Pacific margin. On field trips, Alexander has worked in the Sikhote-Alin, Sakhalin Island, Kamchatka and Chukot Peninsulas, and the Pacific Ocean. He has published extensively on tectonics, metallogenesis, and ore deposits of the Russian Far East. His more than 100 publications include a number of monographs, geological maps, and multiple papers published in prominent Russian and western journals. Professor Khanchuk is a participant of several international projects and a member of authoritative international organizations, with SGA and IAGOD among them. In August of 2004 he was elected the IAGOD President.

Jingwen Mao (Second Vice-President)

Jingwen Mao was born on December 19th 1956. He is a Senior Researcher and Deputy Director of the Institute of Mineral Resources, Chinese Academy of Geological Sciences, Director of Laboratory of Ore Deposits and Mineral Assessment, Chinese Academy of Geological Sciences, and Professor of China University of Geosciences. His major research interests are metallogenic process of ore deposits and their related geodynamic environment, and Re-Os and Ar-Ar dating for mineral deposits.

Prof. Ochir Gerel (Second Vice-President at Large)

Head of the Department of Geology and Mineralogy, Director of Geoscience Center at the Mongolian University of Science & Technology. Graduated in 1964 from the Charles University in Prague in geology, defended Ph.D. degree in 1978 at the Institute of Earth Crust, Siberian Branch of Russian Academy of Science, and obtained a Dr.Sc degree in 1990 at the Institute of Geochemistry, Siberian Branch of Russian Academy of Science. From 1965 she worked at the position of Assistant, Associate Professor and Professor at the Mongolian Technical University, now the Mongolian University of Science & Technology.

Since 1978 she is the head of the Department of Geology and Mineralogy, and since 2001 Director of the Geoscience Center. As head of the Department, she established and developed petrological and geochemical education and research in Mongolia. She has led and attended several projects, namely Geochemistry of Mesozoic granitic magmatism in Mongolia, Geology and Mineral Resources of Eastern and Central Mongolia, Northeast Asia Metallogenesis, Central Asian activated zones, Mineral Resource Assessment Project (GMRAP) and others related to metallogeny of rare metals and porphyry systems, supervised a number of MSC and PhD students.
She worked as a visiting researcher and professor at the Irkutsk State University, Moscow University, Westfalen University and Tohoku University. She is Academician of the International Academy of Higher Education and Russian Academy of Natural Sciences and the author of over 200 scientific publications, editor of scientific Mongolian journals, speaker at more than 60 international Geological Congresses and Symposiums. She is an executive member of International organizations, including the Mongolian Geological Association, AGID, IGCP Working Group 3, IAGOD National Group.

Prof. Nigel John Cook (Secretary General)

Nigel John Cook, a British citizen, was born in 1960 and is based at the Natural History Museum (Geology) in Oslo, Norway. After receiving his B.Sc. and Ph.D. degrees from the University of London, he worked as postdoctoral researcher in Canada (1987-1990) and later (1991-1998) at the University of Würzburg, Germany, where he also obtained his Habilitation. He then joined the Geological Survey of Norway in 1998, serving as leader of the Mineral Resources Section until 2001. He joined the University of Oslo in 2004 as Assistant Professor and was awarded a full professorship in 2005.

His research interests span both mineralogy and ore deposit studies and he is particularly interested in using detailed mineralogical investigation at the micro- and nanoscopic scales to understand ore-forming processes. Field work has taken him to many parts of the world, but he has been most active in Scandinavia and Southeastern Europe, investigating massive sulphide, skarn and epithermal deposits. More recently, he has developed a number of research projects addressing mineral systematics, structures and, in particular, non-stoichiometric minerals.

Nigel has been Secretary General of IAGOD since 2000 and Editor-in-Chief of the IAGOD journal, ‘Ore Geology Reviews’ since 2003. He also served as Associate Editor of ‘The Canadian Mineralogist’ from 2000-2005 and Secretary of the IMA Commission on Ore Mineralogy since 2002. He is currently Project leader of International Geological Correlation Programme (IGCP) project 486 (2003-2007) and the holder of a non-permanent Associate Professorship at the University of Turku, Finland.

Nigel is the author of ca. 70 publications and more than 120 conference contributions on subjects ranging from nanoscale mineralogy to regional metallogenesis, and from platinum group elements to industrial minerals. He has played an important role in convening conference sessions, including numerous IAGOD-sponsored events during his term as Secretary General. Nigel was the Principal Organizer of the inaugural field workshop of IGCP-486, Alba Iulia, Romania, August-September 2004 and co-editor of the resultant volume published in the IAGOD publication series.
Publications:
Cook, N.J., Ciobanu, C.L., eds. (2004): Gold-Silver-Telluride Deposits of the Golden Quadrilateral, South Apuseni Mts., Romania. Guidebook of the International Field Workshop of IGCP project 486, Alba Iulia, Romania, 31st August – 7th September 2004. IAGOD Guidebook Series 12, 266 pp.
Cook, N.J., Ciobanu, C.L. (2004): Bismuth tellurides and sulphosalts from the Larga hydrothermal system, Metaliferi Mts., Romania: Paragenesis and genetic significance. Mineralogical Magazine 68, 301-321.
Cook, N.J., Bonev, I.K. (2005): Au-Ag-Te-Se deposits, IGCP Project 486. Proceedings of the 2005 Field Workshop, Kiten, Bulgaria, Geochemistry, Mineralogy and Petrology 43, Bulgarian Academy of Sciences, Sofia, Bulgaria, 162 pp.

Dipl.-Geol., Dr. rer. nat. Thomas Seifert (Chief Treasurer)

Economic and Exploration Geologist

Date and Place of Birth: August 24th 1959, Zwickau, Germany
Nationality: German
Academic Career:
- 1980 – 1981 study of geology at the Ernst-Moritz-Arndt- University, Greifswald, degree: ‘Vordiplom’
- 1981 - 1985 study of geology at the Bergakademie Freiberg, degree: ‘Diplom-Geologe’
- 1994 Dr. rer. nat. (Ph.D.) in Economic Geology and Metallogeny - TU Bergakademie Freiberg
- different short courses in Economic Geology (1996 -2004): epithermal Au and Cu-Mo-Au porphyry systems; kimberlites, lamproites and diamond deposits; VMS; Ni-Cu-Co-PGE; exploration geology

Knowledge of foreign languages: English (fluent), Russian (medium), Czech (basics)

Professional activities:
1985 - 1986 Head of the Department of Old Mining in Central and SW Saxony, District Department Karl-Marx-Stadt (Chemnitz), Germany
1986 - 1990: Research assistant at the Department of Ore Deposit Geology/Metallogeny and Economic Geology, TU Bergakademie Freiberg
1990 - 1994: Research associate at the Department of Economic Geology, TU Bergakademie Freiberg
1994 - 2003: Associate professor at the Department of Economic Geology and Leibniz-Laboratory for Applied Marine Research, TU Bergakademie Freiberg
since 2004: Acting professor and temporary replacement of the head of the Department of Economic Geology and Petrology, TU Bergakademie Freiberg,

Research projects
1987 - 1993: Metallogeny and exploration study of late-Variscan post-magmatic mineralizations in the Erzgebirge metallogenic province and comparisons with the Sub-Erzgebirge basin, Germany
1994 - 1998: Review of ore deposit geology and economic geology of uranium deposits in eastern Germany
1995 - 1998: Submarine hydrothermal mineralization and evolution of the volcanism in the North Fiji basin, Southwest-Pacific
1997 - 1999: Metallogeny of hydrothermal Ag-Pb-Zn veins worldwide (e.g., Germany, Czech Republic, Canada)
1998 - 2000: Metallogeny of PGE-bearing Cu-Ni-Co mineralization in the Lausitz anticlinal zone, Germany
since 1996: Metallogenic importance of lamprophyres and associated magmatism (Ag-base metal, tin, and gold mineralization)
since 2005: Metallogeny of Cu-Au-U-Ag-Mo-REE “Olympic Dam type” deposits.
Mapping experience
Field mapping of different geological units and ore deposit types: Germany, Czech Republic, Arizona and California, British Columbia, New Brunswick, Chile, Mexico, Namibia, South Africa, Fiji Islands, New Zealand, Australia.

Academic teaching experience
Lessons, courses, and practical work for students of geology/palaeontology, mineralogy, geophysics, geocology, and geoengineering. Courses on: Ore Deposit Geology, Economic Geology of Industrial Mineral Deposits, Metallogeny, Exploration of Mineral Deposits, Methods in Ore Deposit Research, Ore Microscopy, Mineralogy, Petrology, Mapping Courses in Ore Deposit Districts; Field Excursions.

Dr. Reimar Seltmann (Publications Manager)

Dr. Reimar Seltmann graduated from the Technical University (Mining Academy) in Freiberg/Saxony (East Germany) where he specialized in exploration geology (MSc diploma 1984). His PhD thesis (1987) addressed decision-making criteria during prospecting of rare-metals (Sn, W) in the German Erzgebirge and aspects of resource evaluation under self-sufficient conditions of the former Eastern block. From 1987 he worked as a project team leader at the Central Institute for Physics of the Earth (CIPE) of the East-German Academy of Sciences and specialized in the metallogeny of mineralized porphyry breccia pipes. In 1992, after transformation of the CIPE into a new geoscientific research center (GFZ Potsdam), he shifted his research to granite-related metallogeny and published on textures in rare metal granites. He was a visiting research fellow at the Geological Survey of Canada (1995-1997) studying also the Mount Pleasant Sn-W-Mo deposits (New Brunswick), and visiting professor at Carleton University Ottawa (1996).

Since 1999 he has worked as a petrologist and economic geologist at the Natural History Museum in London (UK), where he initiated and coordinates as director the newly formed Center for Russian and Central EurAsian Mineral Studies (CERCAMS). Following his involvement in a number of INTAS projects jointly with his colleagues from the former Soviet Union, his principal research interest became the granite-related metallogeny of Transeurasian magmatic belts, particularly case studies from the regional scale of magmatic provinces to individual world-class deposits such as Muruntau, Kalmakyr, Kumtor etc.

Reimar was the leader of the IGCP project #373 (1997-2002) on ‘Anatomy, textures and magmatic-hydrothermal transition processes of ore-bearing felsic systems in Eurasia’. In result, he was senior guest editor of ‘High-level silicic magmatism & related hydrothermal systems’; (OUP, Journal of Petrology, December 1997, 38, 12) and co-editor of ‘Tectonics & Magma 2001’ (Zeitschrift fuer Geologische Wissenschaften, Berlin, 29, 5/6, 2001 &; 30, 1/2, 2002). Currently he is the leader of the follow-up IGCP project #473 ‘GIS metallogeny of Central Asia’; (2002-2007) that focuses its research on crustal geotranverses and deposit case studies applying GIS platforms. The project resulted in a series of Geology and Mineral Deposits GIS packages on Central Asia, Mongolia, Afghanistan, Urals and others that were compiled as collaborative efforts of the CERCAMS network aiming mining industry, government and academia.
Reimar has produced a large number of original research papers, and as IAGOD Publication Manager he helped editing more than 20 monographs, metallogenic maps and reference guidebooks about metal provinces of the former Soviet Union, Mongolia and China. He has also led several field trips to Uzbekistan, Kyrgyzstan, Russia (Urals, Sikhote Alin), Kazakhstan, Xinjiang, and Mongolia for IAGOD, SGA and SEG.

He is an IAGOD Councillor since 1992, first as Membership Secretary and since 2004 as Publication Manager. He represents IAGOD within SGA as ex-officio councillor and is an SEG Councillor.

Publications:
Seltmann, R., Shatov. V., Yakubchuk, A., 2004. Mineral Deposits Database and Thematic Maps of Central Asia, Scale 1 5 million: ArcView 3.2 and MapInfo 6.0 (7.0) GIS Packages, Explanatory Notes, CERCAMS, Natural History Museum, London, UK., 117 pp.
Seltmann, R., Porter, T.M., 2005. The Porphyry Cu-Au/Mo Deposits of Central Eurasia: 1. Tectonic, Geologic & Metallogenic Setting and Significant Deposits; in Porter, T.M. (Ed.), Super Porphyry Copper & Gold Deposits: A Global Perspective; PGC Publishing, Adelaide, v. 2, p. 467-512.
Seltmann, R., Gerel, O., Kirwin, D. (Eds.), 2005. Geodynamics and metallogeny of Mongolia with a special emphasis on copper and gold deposits. IAGOD Guidebook series vol. 11, London 2005, 225pp. ISBN5-8198-0075-3

Mikhail Rafailovich (Regional councillor for Asia)

Company and position: Scientific Institute of Natural Resources YUGGEO, Almaty, Kazakhstan, Head of Metallogeny Department

Academic title Doctor of Geological and Mineralogical Sciences, Professor

Other scientific posts and positions:
Fellow of the Ural Academy of Geological Sciences
Chairmen of Kazakhstan National Group of IAGOD
Member of Specialized Council of the Thesis Defence (Almaty, Kazakhstan)

Leadership of science projects, expertise:
Senior Expert of International Scientific Project "Geology, Geodynamics and Minerageny of Central Eurasia"
Member of Kazakhstan Council of Prognosis Resources of Minerals

Research interests:
Metallogeny of Au and PGE of Central Asia
Large Gold Deposits associated with black shales
Metasomatic and Geochemical Models of Gold Deposits.

Some recent publications:
Rafailovich M.S. Models of Vertical Geochemical Zoning of Gold Deposits and Their Exploration, Importance. Ust-Kamenogorsk, Kazakhstan, 2002, 166 p.
Rafailovich M.S. Platinum Potential of Kazakhstan's Subsurface. Ores and Metals, 2003. № 2, 19-29.
Rafailovich M.S., Golovanov I.M., Fedorenko O.A. Nikonorov V.V. Geochemical Features and Geochemical Zoning of Gold Mineralization in Black Shales (on Example of Giant Deposits of Ural-Mongolian Belt). Uralian Geological Journal. 2003, № 1, 81-97.
Rafailovich M.S. Non-Traditional Types of Gold Deposits in Kazakhstan. Ores and Metals, 2004 №2, 25-35.
Rafailovich M.S., Los V.I. Large Gold Deposit Akbakay: Mineralogical and Geochemical Zonality, Structure of Gold Distribution, Prognostic Model. Geology and Protection of Bowels of Kazakhstan. 2005. №3, 33-41.
James M. Franklin (Regional councillor for North America)

President, Franklin Geosciences Ltd, Franklin Geosciences Ltd., 24 Commanche Dr., Ottawa Ontario, K2E 6E9 Canada; and also Adjunct Professor at Queen’s University, Kingston, and Laurentian University, teaching graduate course modules in mineral deposits geology

**Principal research interests**

Precambrian ore deposits, volcanic massive sulfide deposits, seafloor hydrothermal systems: Current research activities include seafloor hydrothermal systems, Sturgeon Lake (Ontario) volcanology; Tambo Grande VMS system, Peru (Supervisor, PhD project, UBC), volcanic petrochemistry (supervisor, MSC program)

Consulting geologist, specializing in volcanic massive sulfide deposits, gold deposits, PGE deposits and Precambrian metallogeny; current or recent projects for about 20 clients in northern Ontario, Quebec, Manitoba and the NWT, Finland, Peru, Mexico, French Guyana, Turkey, India and Spain.

From 1992-1998: Chief Geoscientist, Earth Sciences Sector (Geological Survey of Canada and Geomatics Canada): Responsible for coordinating all GSC scientific activities; voting member of the Earth Sciences Sector Management Committee. Responsible for setting priorities and budgets for entire Earth Sciences Sector geoscience program (staff of ~1500) within the framework of Treasury Board and Privy Council Office guidelines. Managed review of NRCan’s science activities for the Govt. of Canada Program Review, and subsequently for reviews of various sectors of the Earth Science Sector: I was responsible for coordinating GSC’s scientific activities with national and international scientific programs (Lithoprobe, Ocean Drilling Program) and with the Provinces and Territories (National Geological Surveys Committee, co-chair). He was also responsible for liaison and program development with various foreign geological surveys (USA, Mexico, China, and India).

**Other posts, positions of relevance and leadership of science projects, expertise, director/administrative responsibilities**

Director, Patrician Diamonds Ltd., Kinloch Resources Ltd., Phoenix Matachewan Ltd., Canadian Scientific Submersible Foundation, Project Neptune, and RJK Resources Ltd. On the technical advisory board to Cornerstone Resources Ltd and Vismand Ltd.;

Co-editor of Exploration and Mining Geology (CIM);

Fellow, Royal Society of Canada, active on various Royal Society committees

Communications Director (1999-2001), Partnership Group for Sciences and Engineering

Past-President, Society of Economic Geologists (2000-2001), active member of the board for SEG’s Canadian Foundation.

Represents Canada’s geoscientists on the Royal Society’s Partnership Group for Science and Engineering, an association of 25 of Canada’s science and engineering societies that has successfully lobbied government to increase funding for science, and recently completed an economic analysis of the value of research to the Canadian economy.

Recently or actively a member of several other boards, including the Canadian Geoscience Council (SEG representative), the CAMIRO Geoscience Board (active), the Lithoprobe Board (retired), chaired the Board of the Canadian Polar Continental Shelf Project. Chaired the Royal Society’s PAGES Communication Committee (1999-2001) is current member of the PAGSE Annual Symposium Committee and recently became a member of the Advisory Board for the Canadian Institute of Advanced Research program “Earth System Evolution”.

**Recent publications**

Hudak, G.J., Morton, R.L., Franklin, J.M., Peterson, D.M., 2003, Morphology, Distribution, and Estimated Eruption Volumes for Intracaldera Tuffs Associated with Volcanic-hosted Massive Sulfide Deposits in the Archean Sturgeon Lake Caldera Complex, NW Ontario: American Geophysical Union Monograph on Subaqueous Explosive Volcanism.

Stix, J., Kennedy, B., Hannington, M., Gibson, H., Fiske, R., Mueller, W., Franklin, J. 2003. Caldera-forming processes and the origin of submarine volcanicogenic massive sulfide deposits." Geology 31: 375-378.

Cousens, B.L., Blenkinsop, J., Franklin, J.M. 2002. Lead isotope systematics of sulfide minerals in the Middle Valley hydrothermal system, northern Juan de Fuca Ridge, American Geophysical Union and The Geochemical Society, United States, 9 pp.
Fábio Ramos Dias de Andrade (Regional councillor for South America)

Fábio Ramos Dias de Andrade was born in 1966 in Blumenau, southern Brazil. He graduated in Geology in 1989 from the Federal University of Paraná, and obtained an M.Sc. (1993) in petrology from the State University of São Paulo. And a Ph.D. 1998 in petrology State University of São Paulo. From 1995 to 1998 he carried out research at GeoForschungsZentrum Potsdam. Since 1999, he has been Lecturer of Mineralogy at the University of São Paulo. His main research interests are:
- applied mineralogy, particularly talc deposits, asbestos contamination, mineralogy of clinker, natural pozzolanes
- X-ray diffratometry, Rietveld analysis

Ian T. Graham (Regional councillor for Australia and SW Pacific)

Bachelor of Applied Science with 1st class honours; Doctor of Philosophy
He is employed as Research Scientist (Geoscience) at The Australian Museum, Sydney.

PhD (awarded in 2000). Thesis Title: The genesis and tectonic significance of chromitite-bearing serpentinites in southern NSW, Australia.

2000-2001 Postdoctoral Research Fellow, Centre for Research on Magmatic Ore Deposits (CERMOD), University of Pretoria, Pretoria, South Africa. Conducting research on the sub-Rustenburg Layered Suite intrusives of the Kaapvaal Craton, South Africa, and their relationship to the Bushveld Complex.

Principal Research Interests: Evolution of large magmatic systems and their associated ore deposits, Magmatic ore deposits, Gem corundum deposits, Zeolites, Application of geochronology to solving timing of geological events.

Organisational Experience
- SW Pacific Regional Councillor (2004- present), IAGOD
- Secretary (2002 – present) Specialist Group in Geochemistry, Mineralogy and Petrology (SGGMP), Geological Society of Australia.
- Organiser, SGGMP field conference on the Newer Volcanics Province of Victoria, Central Victoria, Australia, 30th Sept to 4th October, 2003.
- Organiser, SGGMP workshop on magmatic sulfide-PGE deposits, 17th Australian Geological Convention, University of Tasmania, Hobart, Tasmania, February, 2004.
- Co-convenor of magmatic ore deposits symposium, 17th Australian Geological Convention, Hobart, Tasmania, February, 2004.
- Organiser of the Specialist Group in Geochemistry, Mineralogy and Petrology (SGGMP), Geological Society of Australia, first biennial conference, Port Macquarie, NSW, July 2005.
- Committee member (2004-present), NSW Division, Geological Society of Australia.
- Editorial board member, Records of the Australian Museum, 2004-present.
- Editorial board member, Ore Geology Reviews, 2004-present

**Society Membership**
International Association on the Genesis of Ore Deposits (IAGOD)
Geological Society of Australia
Society for Geology Applied to Mineral Deposits (SGA)
Mineralogical Association of Canada
Sydney Mining and Exploration Discussion Group (SMEDG)
The Geochemical Society

**Current Research Projects**
1. Origin and significance of gem corundum and zircon deposits from intraplate basaltic lava fields of the West Pacific continental margins.
2. Evolution of the Post-Triassic volcanic sequences of eastern Australia and their relationship to Tasman rifting and underlying mantle domains.
3. Characterisation and formation of zeolites within Cenozoic volcanic sequences of Eastern Australia, New Zealand, and Northern Ireland.
4. Origin of calc-silicate xenoliths and their significance with respect to the Ni-Cu-(PGE) massive sulfide mineralisation of the Waterfall Gorge deposit, Insizwa Complex, South Africa.
5. Geochemistry and genesis of the PGE-rich mafic-ultramafic intrusives of the Broken Hill Block, NSW, Australia.
6. Platinum Group Element mineralogy of the Stella layered intrusion, Kraaipan greenstone belt, South Africa.
7. Characterisation of new mineral species from NSW, Australia.

**Recent Publications**
De Waal, S.A., Graham, I.T., Phillips, D., 2002. Age and significance of the Marble Hall breccia. South African Journal of Geology, 105 (3): 227-240.

Graham, I.T., de Waal, S.A., Armstrong, R.A., 2005. New U-Pb SHRIMP zircon age for the Schurwedraai alkali granite (Vredefort Dome, South Africa): implications for pre-impact development of the Vredefort Dome and extent of Bushveld magmatism. Journal of African Earth Sciences (in press).

Graham, I.T., de Waal, S.A., Marshall, B., 2004 Late-magmatic calcite-pyrrhotite-chalcopyrite mineralisation associated with magmatically-evolved diorite, Marble Hall, South Africa. South African Journal of Geology, 107 (4): 545-558.

Graham, I.T., Pogson, R.E., Colchester, D.M., Baines, A., 2003. Zeolite crystal habits, compositions, and paragenesis: Blackhead Quarry, Dunedin, New Zealand. Mineralogical Magazine, Vol. 67 (4): 625-637.

Graham, I.T., Sutherland, F.L., Webb, G.B., 2004. Polygenetic corundums from New South Wales gemfields, Australia. IN: Khanchuk, A.I. et al. (editors); Metallogeny of the Pacific northwest: tectonics, magmatism and metallogenesis of active continental margins. Dalnauka, Vladivostok, Russia, pp. 385-387.

Sutherland, F.L., Graham, I.T., Webb, G., Pogson, P., Giuliani, G., Fallick, A., 2005. New ruby-sapphire sources, Yarrowitch basaltic field, eastern NSW. Geological Society of Australia, Abstracts 76: 133-136.

Sutherland, F.L., Graham, I.T., Zwingmann, H., Pogson, R.E., Barron, B.J., 2005. The Belmore Volcanic Province, northeastern New South Wales, Australia, and some implications for plume variations along Cenozoic migratory trails. Australian Journal of Earth Sciences, 52: 897-919.

Sutherland, F.L., Graham, I.T., Pogson, R.E., Schwarz, D., Webb, G.B., Coenraads, R.R., Fanning, C.M., Hollis, J.D., Allen, T.C., 2002. The Tumbarumba basaltic gem field, New South Wales: in relation to sapphire-ruby deposits of Eastern Australia. Records of the Australian Museum, Vol. 54 (2): 215-248.
A Truly Remarkable Man – Robert Boyle 1920-2003

The world has lost a great geologist and geochemist, and a great Canadian who had contributed to his country for over 60 years. On Monday, August 5th, 2003, Robert William Boyle left this world peacefully after a long struggle with illness, and a much longer struggle with failing eyesight. The latter had not curbed his determination to finish his most recent scientific endeavour, his ‘History of Cosmochemistry and Geochemistry’, which is being considered for publication by the McGill-Queen’s University Press. He completed the last editorial work on the Preface the day before his death with assistance from his daughter-in-law Christy Vodden. Bob, born June 3rd 1920, grew up near Wallaceburg in southwestern Ontario. It was there that he developed his interest and love for the natural world. As a teenager he learned to trap, and saved his earnings from muskrat and mink pelts for his future education. Even from those early days Bob was intrigued with chemistry, and had his own laboratory in the attic of the family farm. It was his friendship with James McCrae, a 70-year-old retired prospector, living two farms away that was critical. One can imagine the impression that the stories of prospecting in Northern Ontario had on the teenager who loved the outdoors. During his last two summers at Wallaceburg High School he decided to earn the money that would enable him go to university and study geology. With contacts from McCrae he joined a prospecting syndicate in northern Ontario, where he started at the bottom - cutting line, and as a driller's helper. Europe went to war in September 1939, and Bob enlisted in the Royal Canadian Artillery two days before Canada joined the war. He used to tell the story of how two Military Policemen arrived at the farm later to collect the ‘errant son’ for not reporting for conscription. His mother Jeannie sent them away with a tongue lashing and a copy of Bob’s regimental address in England!

He spent most of the next six years in the European theatre, where he served with distinction. Initially stationed near Hastings in Sussex, England, as part of the defence of the southern coast, he then took part in the landing in Normandy in 1944 and advanced through France, Belgium, Holland into northwest Germany. Notwithstanding his military service, Bob still made time for geology. While stationed in England, he took geology courses at Imperial College, and correspondence courses from Queen’s University, Kingston. It was at Imperial College that he met Professor H.H. Read of Donegal Granite fame. One has to wonder if seeds were not sown there that later grew to fruition in Bob’s ideas concerning ‘lateral secretion’. Perhaps not out of character, Bob refused a commission and remained a NCO, being discharged on October 26th, 1945, with the rank of lance-sergeant. Just eight days later on November 3rd Bob married his childhood sweetheart, Marguerite Brown, who had grown up on a neighbouring Wallaceburg farm. On his honeymoon, it is told, he spent time studying physics for his university admissions test. In January 1946, Bob enrolled in Geology at the University of Toronto as part of an accelerated program available for returning servicemen. In the summer of 1947 he worked underground for Madsen Red Lake Gold Mines.

He graduated with a degree in Mining Geology in 1949, his Bachelor’s dissertation was on sediments of the Yellowknife Supergroup, based on his work as a summer field assistant for the Geological Survey of Canada (GSC) in 1948. The following year he was again a field assistant for the GSC and J.F. (Fen) Henderson and I.C. Brown in their Yellowknife, NWT, mapping project. In the Fall Bob immediately commenced graduate work at Toronto on the Yellowknife gold deposits, completing his M.A.Sc. in 1950. Through his field mapping with Fen Henderson and graduate work, his potential was recognized by the GSC, and in 1952 he joined as a permanent member of staff. He completed and successfully defended his Doctoral thesis in 1953, subsequently published by
the GSC as Memoir 310, ‘Geology, Geochemistry, and Origin of the Gold Deposits of the Yellowknife District, Northwest Territories’, in 1961. It was during his graduate research on the sediments and shear zones at Yellowknife that Bob developed his ideas on ‘lateral secretion’ as an ore-forming process, and one of the causes of primary geochemical halos surrounding mineral deposits that could be used as guides to their presence.

Bob was a pioneer of the application of geochemistry to mining geology and mineral exploration. In 1955 he persuaded the GSC to provide space for a ‘laboratory for geochemical prospecting studies’. This facility was expanded to a full laboratory in 1957, when he hired Peggy Gilbert and Ron Holman, who were working with John Webb at his Geochemical Prospecting Research Centre at Imperial College, London, and Eion Cameron to broaden the group’s interests into sedimentary lithogeochemistry. Also in 1957 the GSC’s regional geochemistry program commenced with Boyle and Holman’s work in Nova Scotia. In 1961 the GSC moved to a new building with new laboratories at its present Ottawa site on Booth Street. With the support of enlightened senior management conscious of the need to bring hard science into geology, Bob designed these geochemistry laboratories to meet the needs of mineral exploration rather than those of traditional petrochemistry, and hired permanent staff, post-doctoral fellows and students, to undertake field and laboratory studies. Over the years, these included Bob Washington, Art Smith, Adrian Debnam, Chris Durham, John Lynch, Willy Dyck, Chris Gleeson, Don Sangster, John Fortescue, Les Davies, Walter Nash, Mohammed Tauchid and Bob Garrett, names familiar in exploration.

With respect to the North and permafrost regions, it was Bob’s work at Yellowknife and, in particular, at Keno Hill, that demonstrated that geochemical prospecting did work, and that trace elements were dispersed hydromorphically in permafrost regions. Simultaneously Russian geochemists were reaching the same conclusions, confirmed by Bob’s National Research Council exchange-visit to the Soviet Union in 1962. One of his favourite lines of evidence that metals were mobile in sub-Arctic environments, were dendritic gold, silver and zinc metal precipitates that he had collected from ice-veins in the Yellowknife and Keno Hill deposits. It was the research he undertook at Keno Hill that guided the development of geochemical prospecting tools ensuring that a ‘dying mining camp’ continued in production some 30 more years until the 1980s.

Bob’s interest in gold, silver, uranium and thorium took him to many parts of the world: the USA, the USSR, Finland, Norway, Sweden, Great Britain, Eire, France, Greece, Bulgaria, Fiji, Australia, New Zealand, Japan, China, India, many countries in Africa, and Brazil. He put together some of his best known publications based on his global observations and knowledge: ‘The Geochemistry of Silver and its Deposits’ (GSC Bulletin 160, 1968); ‘Elemental Associations and Indicators of Interest in Geochemical Prospecting’ (GSC Paper 68-58, revised as Paper 74-45 ); ‘The Geochemistry of Gold and its Deposits’ (GSC Bulletin 280, 1979); and ‘Geochemical Prospecting for Thorium and Uranium Deposits’ (IAEA, Vienna, 1981). It is not really appropriate to single out these publications; his contributions were many. Bob was a prolific writer, and during his career published over 160 papers, books and articles. He thought about what he was going to write extensively and thoroughly before he put down his words. At the GSC the quality of his first drafts was legendary. He believed writing should be clear and concise, as he said, ‘like a Scotsman sending a telegram’.

In the 1970s, as government and public interests in environmental issues came to the fore, Bob and Ian Jonasson co-authored a series of reports commissioned by the National Research Council of Canada on trace element cycles and abundances in the natural environment. These stressed the importance of geology, mineralogy and
Bob was interested in history and archeology, and was widely read. Many of his publications included references and anecdotes concerning the history of mining and mineral exploration back to the times of early civilizations in Europe and Asia. It was his interest in history that drove many of his later writings following his retirement from the GSC in 1985: for example, ‘Gold: History and genesis of deposits’ published by the Society of Economic Geologists in 1987. The truth of the matter is that Bob never retired from his love of geochemistry, as evidenced by his commitment to completing his last book just prior to his death.

Bob was a committed family man. One of the joys of the family were summer holidays spent together at places across Canada where Bob was undertaking field work - a luxury for geologists, who are so often in the field during their children’s holidays. His children, Heather and Dan, followed him into science, Heather as a biochemist (Carleton and Victoria University of Wellington, NZ) and Dan as a geochemist (Queen’s and Imperial College, UK). Although he spoke of it rarely, the loss of Dan, who followed his father to a distinguished career in the GSC, to cancer in 2000, was a grievous blow. Outside the family and work, his love for his vegetable garden was well known to his colleagues, who benefited from the surplus in good harvest years. This love did not extend to farming; he had seen enough of the difficulties of the 1930s to leave bitter memories.

During Bob’s career he contributed in many ways to his profession and received recognition for his service. He was elected to the Royal Society of Canada in 1957, astonishingly only four years after obtaining his doctorate, and received the Willett G. Miller Medal for outstanding research in the earth sciences in 1971. The Miller Medal citation stated, "one of Canada's leading exploration geochemists, who has made fundamental advances in the study of the deposition of ores, the dispersion of elements around ore bodies, and the formulation of new methods in the search for natural resources. ... He has won an international reputation for his many contributions to our knowledge of the distribution of metals in the earth's crust, the concentration of these metals in nature as orebodies, and the successful application of geochemistry to the search for hidden ores." Words as true today as they were 30 years ago, and he did not let up in later years. He was elected a Fellow of the Royal Canadian Geographical Society in 1955. His contributions to the minerals industry were recognized by the Prospectors and Developers Association with their Distinguished Service Award in 1993, and induction into the Canadian Mining Hall of Fame in 1997. This is located at the University of Toronto’s (his Alma Mater) Mining Building, and in today’s connected world exists globally as http://www.halloffame.mining.ca. Similarly, he was recognized by the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) with their Barlow Medal in 1966 (with John Jambor), and again in 1983, for outstanding publications in the CIM Bulletin. He was further elected a CIM Fellow in 1993, and in 2002 was awarded their Distinguished Service Medal. This was the same year that Dan posthumously received the Julian Boldy Memorial Award, a singular distinction in that it was the first time two members of the same family received awards in the same year. Bob’s contributions to the geology and geochemistry of the Bathurst mining camp were recognized by the local geological community with a Service Award at the 1993 CIM Geological Field Conference held in Bathurst. The penultimate publication to bear Bob’s name, as co-author with Steve McCutcheon and Bill Luff concerned Bathurst, ‘The Bathurst Mining Camp, New Brunswick, Canada: History of discovery and evolution of geological models’, to be published in Economic Geology Monograph 11, ‘Massive sulphide deposits of the Bathurst Mining Camp, New Brunswick, and Northern Maine’.

Bob took on responsibilities with the professional societies that supported the science to which he was committed: the Geological Association of Canada (GAC), the Society of Economic Geologists (Councillor, 1981-1985), and the International Association for the Genesis of Ore Deposits (IAGOD). He was a founding member of IAGOD at St. Andrew’s University, Scotland, in 1966, its first Treasurer, Vice-President (1978-1989), President (1989-1992) and Chairman of the Organizing Committee for the 8th IAGOD Symposium in Ottawa, June, 1990. That year he was also made an Honorary Professor of the University of Earth Sciences, Changchun, China. In 1971 he received the Public Service of Canada Merit Award for his contributions to science in the federal government. His abilities as an editor, along with his coeditors, were recognized by the Society of Technical Communicators’ 1991 Award of Excellence for editing ‘Sediment-hosted Stratiform Copper Deposits’ published by the GAC. In 1992 his long years of service to the Mineralogical Association of Canada were recognized by the award of their Past President’s Medal. In 1999 he was made an Honorary Life Member of IAGOD – a rare honour that recognized an outstanding life-time commitment to the geology and geochemistry of ore deposits. In 1966, driven by his desire to foster the development of geochemical prospecting, Bob organized at the GSC the first of a series of meetings (see GSC Paper 66-54) that were to develop into the biennial International Geochemical Exploration Symposia (IGES). In 1970 he was Chairman of the 3rd IGES in Toronto. It was at that meeting that the Association of Exploration
Geochemists (AEG) was founded, and he took an active role in its early years as a member of its first Council (1970-1973), Vice-President (1973-1975) and President (1976).

His significant contributions to exploration geochemistry were recognized by the AEG with his election to Honorary Membership in 1989. He was awarded the Association’s Gold Medal in 1999 at the 19th IGES in Vancouver, BC, 33 years after the first meeting of the continuing series he founded. The citation stated, “in recognition of his lifetime of outstanding achievement in exploration geochemistry, during which, through his leadership and productivity, he played a key role in developing the science in Canada, advancing our knowledge of precious metals, applying geochemistry to mineral exploration and to environmental issues in Canada and around the globe, establishing exploration geochemistry at the Geological Survey of Canada, and training young geochemists.” Bob’s commitment to training and teaching came through in many ways. The students hired into the GSC for summer field and laboratory work who worked with Bob were exposed to geochemical prospecting, which later became known as exploration geochemistry, and his own enthusiasm. Importantly, Bob inspired many of these students to pursue careers in geochemistry and mineral deposit studies. One such occasion was when he visited the Lakehead, Ontario, while working on his ‘Silver Bulletin’. He met Jim Franklin, a future Chief Geoscientist at the GSC, as a student and took time to guide him around the Sibley silver deposits that became the subject of Franklin’s graduate thesis. This was just one of many examples of Bob’s willingness to help students. He was a Special Lecturer in Geochemistry at Carleton University, Ottawa, from 1955 to 1975. As part of his Carleton responsibilities he taught a Prospecting Course, and one is tempted to draw the parallel to his exposure to the old prospector James McCrae in Wallaceburg in the 1930s, and how Bob would have given ‘new prospectors’ an enthusiasm for the search for precious metals. More formally, he was a constant proponent of exploration geochemistry and was one of its best known ambassadors, either as a visiting lecturer or a consultant to UNESCO, UNDP and the World Bank. He was a Regional Lecturer for the CIM in 1966, 1968 and 1973, and their Distinguished Lecturer for 1980-81; a Senior Lecturer at the International Atomic Energy Agency (1975); and Visiting Lecturer at Jadavpur University, Calcutta, India (1981), and at Escola de Engenharia, Porto Alegre, Brazil (1985). Bob’s connection to precious metals continued to the very last, he died on almost the 100th Anniversary of the discovery of silver at Cobalt, Ontario, August 7th, 1903, http://www.nt.net/cobalt/minemus.htm.

On a personal note, Bob was a wonderful person. He could always add something interesting and provoking to a discussion, he was a superb raconteur, and always generous with his time and his friendship, especially to younger scientists. We have lost a truly remarkable man, and those lucky enough to have met him, known and worked with him, will not forget.

Contributed by Robert G. Garrett, Geological Survey of Canada, Ottawa

Reports of the IAGOD National groups

Report of the Russian IAGOD National Group for 2003-2005

Scientific meetings organized by the members of Russian IAGOD group

1. The 1st National conference on “Raw Material Base of Non-Metallic Mineral Deposits and Present State of Relevant Scientific Investigations in Russia” was held in IGEM RAS, Moscow, on April 24-25, 2003. Among active participants, there were scientists dealing with the industrial minerals and rocks from Moscow; Kazan’(where the Central National Institute of Non-Metallic Mineral Commodities, so-called TsNIIGeolNerud, is located), Petrozavodsk, Novosibirsk and Lyubertsy (a village in Moscow suburbs, where Institute of Agricultural Mineral Commodities, GIGKhS, is located). The audience have considered and discussed 35 contributions including that on present problems of mineral raw material base of Russia delivered by Dr. E.A. Kozlovsky, past minister of geology, the USSR.
2. A group of IAGOD and Russian Mineralogical Society members have organized in Magadan a Conference “Geodynamics, Magmatism and Mineralogy of Continental Margins of the North Pacific” (June 3-6, 2003) dedicated to 90th Anniversary of Academician N.A. Shilo. Topics of the meeting included: (1) Geology and Geodynamics of the Continent - Ocean Transition Zone, (2) Sedimentary Basins, their Geological Structure, History, Oil and Gas Resources, (3) Magmatism and Magmatic Indications of Geodynamic Environments, (4) Problems of Metallogeny, Mineralogy and Genesis of Mineral Deposits.

3. A field conference on “Magnesite and Talc” (September 28 – October 7, 2003) was organized by Russian section of COIMR headed by Professor V.V. Nasedkin, IGEM RAS, and V.I. Lukashov, President of the Russian Association of Industrial Minerals in cooperation with IGCP 443 Project (leader – Dr. M. Radvanec, Slovakia). A detailed program of the meeting was published in Newsletter-2003, p. 47. The Shabrov deposit of magnesite and talc, the Satka, Katav-Ivanovsk and Khalilov magnesite deposits, the Siroshtan talc deposit and the Bakal deposit of magnesite and siderite were visited in Middle and South Urals.

4. The XI International Fluid Inclusion Research Conference was held on September 8-12, 2003, being organized by Russian section of COFFI and hosted by Russian National Institute of Mineral Commodities Synthesis (VNIISIMS), Alexandrov city, Russia. It was attended mainly by Russian scientists from Moscow, Syktyvkar (Komi Republic of Russia), Apatity (Kola peninsula) and few scientists from Ukraine and Uzbekistan. But many authors of presented abstracts from Novosibirsk, Irkutsk, Ulan-Ude and Vladivostok could not attend the meeting due to restricted financial support. Abstracts of contributions were issued before the conference, and the proceedings should be published soon. Contact person for getting the Proceedings is Deputy Director General of VNIISIMS Dr. E.V. Polyansky.

5. The International Jubilee Conference “Single crystals and their application in the XXI century –2004” was held in Alexandrov, Russia. This was a technical conference dedicated to the 50th Anniversary of VNIISIMS and related to research projects, achievements and devices in the following areas:
- piezoelectric and ferroelectric materials;
- scintillators;
- optical materials;
- wide bandgap semiconductors;
- thermobarogeochemistry (fluid inclusion studies in minerals).

The conference was chaired by Raymond Besson (France) and Vitaly Skorikov (Russia). It was attended by several prominent scientists, experts in the above fields from U.K., France, Sweden, South Korea and Taiwan.

TsNIGRI Publications:

Next monographs of the series “The Models of diamond, noble and non-ferrous metal deposits” (continued from IAGOD-Newsletter-2003, pp. 36-37):

(6) A.I. Krivtsov, O.V. Minina, A.G. Volchkov, E.E. Abramova, D.V. Grichuk, E.A. Elyanova. Massive sulfide deposits. Editor: A.I. Krivtsov. M.: TsNIGRI, 2002. 298 p., 126 fig. ISBN 5-85657-062-6.

Massive sulphide deposit models, such as prediction-prospecting, geologic-economic (statistical), parametric, morphometric, concentration, and gradient-vector ones constructed on a basis of systematization of a great body of information on the national and foreign deposits are described. The regularities of distribution of massive sulphide deposits, their typification and time-space relationships with the deposits included into the same single series of the ore formations (ore types) are considered. A history of development of geologic-genetic models of pyrite-forming systems, the nature and condition of formation of ore-bearing solution and ore-metasomatic zoning, physico-chemical and thermodynamic ore-formation parameters are analyzed. The quantitative thermo- and hydrodynamic models of hydrothermal convective-recycling ore-forming systems based on a gradient-vector analysis of their geometry and structure, hydrodynamic features and heat-mass transfer calculations with the use of computer simulation are developed.

The book is intended for a wide community of specialists in the field of metallogeny, geology, prediction, and prospecting of ore deposits as well as for professors and students of universities, geologic and mining colleges.
Models of carbonate-hosted stratiform lead-zinc deposits such as economic quantitative (statistical) models, prediction-prospecting ones, parametric, morphometric, concentrational, and gradient-vectorized ones constructed on a basis of systematization of a great body of information on the national and foreign deposits are described. The typification of carbonate-hosted stratiform lead-zinc deposits is given. The regularities of this deposits’ distribution and time-space relationships with the terrigenous-carbonate structural-material units of the sedimentation basins of intracratonic and passive continental margin types are considered. The nature of metalliferous brines and metal mobilization and the transportation patterns are analyzed. The elisional-hydrothermal hydrodynamic model of ore-forming system, which includes hydrodynamic situation, basic action mechanisms and quantitative evaluations of filtration scales and rates of metalliferous fluids was developed. The hydrogenic geological-genetic models of epigenetic exfiltration and sedimentary-exfiltration types of carbonate-hosted stratiform lead-zinc deposits based on computer simulation of physicochemical factors of ore-bearing brines formation and ore accumulation are developed. Characteristic features of deposits and orebodies transformation under effect of complex and lasting metamorphism processes are produced.

The book is intended for a wide community of specialists in the field of metallogeny, geology, prediction, and prospecting of ore deposits as well as for professors and students of universities, geologic and mining colleges.

The reference book contains systematized characterizations of spatial metallogenic taxons of different ranks, controlling the location of diamond, noble and non-ferrous metals deposits. The descriptions of the taxons have both prognostic-exploration content and goal; they are based on ore-formational classification of corresponding deposits. Each ore type is represented in the book by prognostic-exploration models, which are related to the features of metallogenic taxons according to a principle of successive approximations.

The book is intended for a wide community of specialists in the field of prediction and exploration for a diamond, noble and non-ferrous metals deposits; it can be applied in compiling prognostic-metallogenic maps and in training specialists in mining and geological colleges.

Series of publications: Prognostic-metallogenic maps:

Abstracts of new Russian papers (or with participation of Russian geologists attended):

The paper is presenting the results of studies of boron concentrations in ore-forming fluids responsible for production of large and giant hydrothermal deposits of various geochemical profiles. A wide range of hydrothermal deposits is considered: those of gold-porphry type (the Darasun, Transbaikalia), mesothermal gold (the Berezovsk and Kochkar, Urals; Olympiada, Enissei mountain range; Lebedinoye and Samolazovskoye, Aldan); gold-platinum deposits (Sukhoy Log, Eastern Siberia; Chudnoye, Polar Urals; Waterberg, South Africa); tin deposits (Industrialny, North-East Russia; Khingansk, Solnechnoye and Festival, from Amur and Khabarovsk regions), tungsten deposits (Spokojnoye from Transbaikalia; Akchatau from Kazakhstan),

(7) G.V. Ruchkin, A.I. Donets. **Carbonate-hosted stratiform lead-zinc deposits.** Editor: A.I. Krivtsov. M.: TsNIGRI, 2003. 123 p., 45 fig. ISBN 5-85657-063-4.

(8) V.I. Vaganov, A.G. Volchkov, V.I. Kochnev-Pervukhov, A.I. Krivtsov, V.V. Kuznetsov, I.F. Migachev, V.P. Novikov and G.V. Ruchkin. – **Spacial metallogenic taxons.** A reference book. Editors A.I. Krivtsov and G.V. Ruchkin. Moscow: TsNIGRI, 2003, 82 pp., 15 fig., 20 tables.
In the Early and Middle Proterozoic, marine sedimentary basins developed on major cratons and were the loci for ironstone. Seven processes overlapping in time were responsible for most of metallogenic and geologic complexities of the region. Northeast Asia resulted in formation of the present ring of volcanoes and contained metallogenic belts around the Circum-Pacific. In the middle and late Cenozoic, oblique to orthogonal convergence of the Pacific Plate with present-day Alaska and the Canadian Cordillera resulted in major periods of rifting occurred along the ancestral margins of present-day Northeast Asia and northeastern North American. The rifting also resulted in formation of various massive-sulfide metallogenic belts. From about the late Paleozoic through the mid-Cretaceous, a succession of island arcs and contained igneous-arc-related metallogenic belts, and tectonically paired subduction zones formed near continental margins. From about mainly the mid-Cretaceous through the present, a succession of continental-margin igneous arcs (some extending offshore into island arcs) and contained metallogenic belts, and tectonically paired subduction zones formed along the continental margins. From about the Jurassic to the present, oblique convergence and rotations caused orogen-parallel sinistral, and then dextral displacements within the plate margins of the Northeast Asian and North American crusts. The oblique convergences and rotations resulted in the fragmentation, displacement, and duplication of formerly more continuous arcs, subduction zones, passive continental margins, and contained metallogenic belts. These fragments were subsequently accreted along the margins of the expanding continental margins. From the Early Jurassic through Tertiary, movement of the upper continental plates toward subduction zones resulted in strong plate coupling and accretion of the former island arcs, subduction zones, and contained metallogenic belts to continental margins. In this region, the multiple arc accretions were accompanied and followed by crustal thickening, anatexis, metamorphism, formation of collision-related metallogenic belts, and uplift; this resulted in the substantial growth of the North Asian and North American continents. And in the middle and late Cenozoic, oblique to orthogonal convergence of the Pacific Plate with present-day Alaska and Northeast Asia resulted in formation of the present ring of volcanoes and contained metallogenic belts around the Circum-
North Pacific. Oblique convergence between the Pacific Plate and Alaska also resulted in major dextral-slip faulting in interior and Southern Alaska and along the western part of the Aleutian-Wrangell arc, associated with dextral-slip faulting was crustal extrusion of terranes from Western Alaska into the Bering Sea.

(4) A.A. Obolenskiy, S.M. Rodionov, Gunchin Dejidmaa, Ochir Gerel, Duk Hwan Hwang, E.G. Distanov, Gombosuren Badarch, A.I. Khanchuk, Masatsugu Ogasawara, W.J. Nokleberg, L.M. Parfenov, A.V. Prokopiev, Zh.V. Seminskii, A.P. Smelov, Hongquan Yan, G.V. Birul'kin, Yu.V. Davydov, V.Yu. Fridovskiy, G.N. Gamyatin, A.V. Kostin, S.A. Letunov, Xujun Li, V.M. Nikitin, Sadahisa Sudo, V.I. Sotnikov, A.V. Spiridonov, V.A. Stepanov, Fengyue Sun, Jiapeng Sun, Weizhi Sun, V.M. Supletsov, V.V. Timofeev, O.A. Tyau, V.G. Vetluzhskikh, Koji Wakita, Ya.V. Yakolev, and L.M. Zorina - Preliminary Metallogenic Belt and Mineral Deposit Maps for Northeast Asia U.S. Geological Survey Open-File Report 03-204 Menlo Park, California, 2003, 4 sheets of maps and 204 pages of a pamphlet. Web at: http://geopubs.wr.usgs.gov/open-file/of03-204/

The metallogenic belts and locations of major mineral deposits of Northeast Asia are portrayed on Sheets 1-4. Sheet 1 portrays the location of significant lode deposits and placer districts at a scale of 1:7,500,000. Sheets 2-4 portray the metallogenic belts of the region in a series of 12 time-slices from the Archean through the Quaternary at a scale of 1:15,000,000. For all four map sheets, a generalized geodynamics base map, derived from a more detailed map by Parfenov and others (2003), is used as an underlay for the metallogenic belt maps. This geodynamics underlay permits the major host geologic units and structures that host metallogenic belts. Four tables are included in this report. A hierarchial ranking of mineral deposit models is listed in Table 1. And summary features of lode deposits, placer districts, and metallogenic belts are described in Tables 2, 3, and 4, respectively. The metallogenic belts for Northeast Asia are synthesized, compiled, described, and interpreted with the use of modern concepts of plate tectonics, analysis of terranes and overlap assemblages, and synthesis of mineral deposit models. The data supporting the compilation are: (1) comprehensive descriptions of mineral deposits; (2) compilation and synthesis of a regional geodynamics map of the region at 5 million scale with detailed explanations and cited references; and (3) compilation and synthesis of metallogenic belt maps at 15 million scale with detailed explanations and cited references. These studies are part of a major international collaborative study of the Mineral Resources, Metallogenesis, and Tectonics of Northeast Asia that is being conducted from 1997 through 2002 by geologists from earth science agencies and universities in Russia, Mongolia, Northeast China, South Korea, Japan, and the USA.

(5) S. Ariunbileg, G.V. Biryul'kin, J. Byamba, Yu.V. Davydov, G. Dejidmaa, E.G. Distanov, D. Dorggotov, G.N. Gamyatin, O. Gerel, V.Yu. Fridovskiy, A. Gotovsuren, Hwan Hwang Duk, A.P. Kochnev, A.V. Kostin, M.I. Kuzmin, S.A. Letunov, Xujun Li, G.D. Malceva, V.D. Melnikov, V.M. Nikitin, A.A. Obolenskiy, M. Ogasawara, D. Orolmaa, L.M. Parfenov, N.V. Popov, A.V. Prokopiev, V.V. Ratkin, S.M. Rodionov, Zh.V. Seminskii, V.I. Shpikerman, A.P. Smelov, V.I. Sotnikov, A.V. Spiridonov, V.V. Stogniy, Sadahisa Sudo, Fengyue Sun, Jiapeng Sun, Weizhi Sun, V.M. Supletsov, V.V. Timofeev, O.A. Tyau, V.G. Vetluzhskikh, Aihua Xi, Ya.V. Yakolev, Hongquan Yan, V.I. Zhizhin, N.N. Zinchuk, and L.M. Zorina - Significant Metalliferous and Selected Non-Metalliferous Lode Deposits, and Selected Placer Districts of Northeast Asia /Edited by W.J. Nokleberg, T.V. Bounaeva, R.J. Miller, Zh.V. Seminskii, and M.F. Diggles. USGS Open-File Report 03-220, version 1.0 Menlo Park, California, 2003, 422 p. Web at: http://geopubs.wr.usgs.gov/open-file/of03-220/

The report contains a digital database on lode deposits and placer districts of Northeast Asia. This region includes Eastern Siberia, Russian Far East, Mongolia, Northeast China, South Korea, and Japan. In folders on this site are a detailed database, a bibliography of cited references, descriptions of mineral deposit models, and a mineral deposit location map. Data are provided for 1,674 significant lode deposits and 91 significant placer districts of the region.

(6) S.M. Rodionov - The geodynamics and tin metallogeny of Eastern Russia. // Tikhookeanskaya Geologiya (the Pacific Geology). 2003. №6. P.98-112. (in Russian)

Five Sn provinces of Russian Far East possess the identical geodynamic setting. Each occurs at the triple junction of cratonic, accretionary wedge or subduction zone, and turbidite basin terranes. The junctions are overlapped by calc-alkaline volcanic-plutonic belts of Late Mesozoic and Early Tertiary age. The volcanic-plutonic belts contain two types of Sn-bearing, multiple intrusive complexes - granodiorite-granite and diorite-granodiorite ones. The complexes differ by variation of Sn from early to late phases, by petrographic composition of the main phase, by the tectonic setting, and by related types of tin deposits. The granodiorite-granite complex hosts Sn quartz vein, Sn greisen, and Sn pegmatite deposits. The diorite-granodiorite complex hosts Sn-base-metal vein and Sn porphyry deposits.

However, the complexes display many similarities of chemical evolution. Both are characterized by a gradual increase in Al2O3/(Na2O + K2O + CaO) from early to late phases. Both complexes display similar fractionation trends. The evolution trends of normative mineral composition in an AQP diagram are similar for both complexes. K-Rb correlation data and initial Sr isotope rock ratios of both types of Sn-bearing magmatic complexes occur in a field of mixed mantle-crustal material. The early phases of both complexes contain a relatively great mantle component. Late-phases rocks are relatively enriched in crustal material.

Both Sn magmatic complexes are interpreted as derived from a deep-seated upper mantle-lower crustal source during a period of collision or accretion of an oceanic plate to the paleocontinent.
The geological-geophysical features, ore potential, and problems of developing the mineral-resource base of the Hingan- Olonoy tin-ore district are described. The individual criteria are investigated and the complex criteria are elaborated for prediction and estimation of the economic mineralization in tin-ore areas of the Far East Russia. The influence of the deep ore-bearing structures generating mineralization in the crust and mantle is estimated. The possibilities of providing the mineral resources for tin mines are revealed. The objects promising for the economic mineralization are distinguished within the Hingan, Beryezovskoye, Central, and Karabash groups of mineral deposits in the course of studies and analysis of the geological-geophysical investigations carried out in the Hingan-Olonoy district. The data are shown on the quantity and quality of the calculated reserves and predicted ore resources and the related mineralization. The areas for carrying out the top-priority works are recommended for further investigation.

The loss of noble metals, particularly Au, during ore dressing remains very significant (approximately 70%) due to a subordinate role of the easily extractable (visible) gold in the majority of Uralian VMS deposits. We studied the distribution of noble metals and composition of native gold in ores and sulfide concentrates of the Gai, Uchaly, Uzel'ga, Aleksandrinka, Saf'yanovka, Degtyar, and other deposits in the Urals. Based on mineral geothermometers and fluid inclusions, the temperature of ore deposition varied from 150 to 380°C. The IgS2 deviation from the chalcopyrite-bornite equilibrium line was relatively insignificant and ranged from -12 to -5 in the majority of studied associations. Under such conditions, (bornite + fahlore) and (chalcopyrite + fahlore) paragenetic associations are most typical. At each temperature level, fugacity needed for the formation of Au-rich ores (1.5-2 g/t Au and more) was one to two orders of magnitude higher relative to ores with a normal Au content of approximately 1 g/t. Large gold flakes (100-1000 mkm or more) are found in deposits with significantly metamorphosed ores (Gai, Degtyar, Karabash, and San Donato). In weakly altered ore deposits (Uzel'ga, Uchaly, Molodezhnoe, Aleksandrinka, and Saf'yanovka), native gold is observed as rare tiny grains (5-25 mkm). Larger grains (up to 150-200 mkm) are detected in areas characterized by the superposition of late hydrothermal processes (recrystallized ores) and quartz+sulfide+(barite, tennantite) veinlets. Based on microprobe data, native gold from massive sulfide ores of the Urals is characterized by a wide compositional range. It contains the following elements (wt %): Ag (2.6-45), Cu (up to 4.9), Hg (up to 1.6), Te (up to 1.2), Fe (up to 0.42) and, in some cases, Pd (up to 0.85), Pt (up to 2.23), Se (up to 0.5), Co (up to 0.4), Ni (up to 0.3). Compositions of the native gold in Au-Ag alloys overlap, but the low-grade gold is more typical of unmetamorphosed ores. For example, Au content in the native gold from the Saf'yanovka deposit is 53-81 wt % (generally <70 wt %). Native gold flakes found in moderately altered ores from the lower level of the Uzel'ga deposit contain 67-87 wt % Au. Native gold from strongly metamorphosed ores of the Gai deposit is distinguished from counterparts from other Uralian deposits by increased Au concentrations and their maximum scatter (52-97 and generally >80 wt %). Native gold from the San Donato deposit is also characterized by a significant scatter of Au concentration (54-85 wt %). Comparison of ores from the Saf'yanovka, Gai, and San Donato deposits revealed an inverse correlation of Au with Fe in the associated sphalerite. This trend of sphalerite composition may be related to an increase of fS2 in fluid. The Z-shaped variation mode of native gold composition obviously reflects the continuous-discrete character of the Au-Ag solid solution. The presence of possible miscibility gaps in this binary system is discussed. Occurrence frequency of electrum (AuAg) in Uralian massive sulfide deposits is inferior to that of Au2Ag and Au3Ag.

The emphasis is on the major debated problems of formation of volcanic-associated massive sulfide (VMS) deposits: the relation between ore genesis and tectonic-metamorphic history of fold belts, main contributors of components of fluid, PT-conditions of metasomatism and ore mineralization. The systematic of the VMS deposits, taking into account the chemistry of ores, style of volcanism, and geodynamic conditions of ore formation is reviewed: the Cyprus, Uralian, and Kuroko (for Phanerozoic deposits) and Mid-oceanic (mainly modern) types are distinguished. The modern mineralization in the seafloor sulfide deposits is controlled by the specifics in changing temperature, pH, and phase separation of the fluid. New serpentinite-related type of submarine sulfide deposits was under study on the example of two hydrothermal fields of Mid Atlantic Ridge (Rainbow and Logachev). The geological and genetic models of VMS deposits at the Urals and Roudnyi Altai are discussed on the basis of the results obtained from the study of the ore fabrics, metamorphic mineral parageneses and of the composition of individual grains of ore minerals and fluid inclusions in them. Sr and stable (S,0,C) isotope studies revealed dual (oceanic and juvenile) nature of source of ore-forming fluid. Local extensional structures related to the island arc geodynamic conditions were favorable for formation of the massive sulfide deposits. Low grade metamorphism (prehnite-pumpellyite to greenschist facies) caused appearance of steep dipping ore bodies, their flattening and redistribution of ore matter. Metamorphic massive sulfides were deposited mainly at extensional structures (fold hinges, pressure shadows of boudins etc.). Gold occurs mainly as
invisible in sulphides from the modern submarine chimneys and form thin (1-150 mkm) inclusions of native gold (fineness
520-920) and tellurides in Palaeozoic ores.

(10) V.I.Pozhilenko, B.V.Gavrilenko, D.V.Zhirov, S.V.Zhabin - Geology of mineral areas of the Murmansk Region.
Editors: F.P. Mitrofanov, N.I. Biehak. // Apatity: Kola Science Centre RAS Publ. 2002. 359 p. Figs. – 159 , tabl. – 7 , annexes
– 3, refs. – 683.

The book "Geology of mineral areas of the Murmansk Region" is the newest report on geology and mineral resources of the
Kola Region of the Fennoscandian (Baltic) shield. The retrospective analysis of geological prospecting strategy and its results
for the territory is made. The complex of issues and features of regional geology including role and position of the Kola
Region in geological structure of the Fennoscandian shield, magmatism, stratigraphy, geochronology, tectonics,
geomorphology and state of the mineral base is discussed. The monograph submits minerogenetic zoning of main ore and
industrial mineralization and gives regional spreading regularity of mineral deposits.

The Murmansk Region is subdivided into 15 ore districts. Their descriptions integrate detailed reference data on a geographic
location, economic situation and geology including the main geological structures, units, formations, intrusive bodies, fractures
etc. As a result of the analysis and interpretation of all seismic and geological data, the models of a deep structure are
developed. A general strategy of utilizing the most important mineral resources of these areas has been suggested, based on
new data on different commodities, state of the mining industry of the region and the modern tendencies in Russian economics.

The well-known deposits, many of which play an important role in economy of Russia, such as the Rasvumchorr and
Kukisvumchorr ones (apatite-nepheline ores and rare metals), Rikolatva (muscovite), the deposits of Kovdor Massif (apatite-
magnetite-baddeleyite, vermiculite and phlogopite) etc. are described. Besides, the monograph gives materials on new ore
deposits and occurrences, among which the Malaya Pana (PGM), Salanlatva (barite ores and rare metals), Seb'lyavr
(phlogopite and rare metals), Southeast Gremyakha (titanium ores), N'orkpakhk and Oleni Ruchei (apatite-nepheline ores and
rare metals), Vasin-Mylfk (rare metals), Oleninskoe (gold), Aluaiv (eudialite - Zr ores) and others are considered.

The state of the Kola Region mining industry, including the largest European mining companies “Apatit” and “JSC Kola
Mining & Metallurgical Company” and some other big enterprises (“KovdorGOK”, “Kovdorsluyda”, “Olikon”, “Lovozerskaya
Mining Co.”), is also given.

The edition contains three supplements: "Geological Map of the Kola Region” with Legend (Editor-in-Chief: F.P. Mitrofanov;
Editors: A.T.Radchenko, C.Gillen; compiled by V.V.Balagansky, A.A.Basalaev, O.A.Belyaev, V.I.Pozhilenko,
A.T.Radchenko, M.K.Radchenko) and Catalogue of geochronological data on the north-eastern Baltic Shield» (Editor: F.P.
Mitrofanov; the compilers-authors: T.B. Bayanova, V.I. Pozhilenko, V.F. Smolkin, N.M. Kudryashov, T.V. Kaulina and V.R.
Vetrin.).

The monograph is intended for geologists, mining engineers, economists, businessmen, scientists, professors and teachers of
geology and economic geology in universities and colleges.

Announcement:

Association “Industrial Minerals” activity is directed to development and promotion of economic branches related to usage
of non-metallic mineral commodities. An International Chinese-Russian Scientific-Research Centre on Industrial Minerals
was open in Sian’ city, China. The goals of the Centre are the introduction of progressive technologies, attraction of
investments, rise of quality of industrial minerals and development of economic relations between China and Russia. The
preparations are now made to start Association membership in Chamber of Commerce of Russian Federation and creation
of subcommittee on industrial minerals in this Chamber.

Association “Industrial Minerals” along with the International Centre on Industrial Minerals announce the start of
Competition of Investment Projects, whose main goal is promotion of best scientific-technical ideas (inventions, useful
models, “know-hows”, results of scientific works etc.) to a market and application of the achievements of science into
production.

Mr. Vladimir I. Lukashov, President,
The Association “Industrial Minerals”,
1st Mashinostroenia Str., 4, bldg 2,
Yugo-Vostok (South-East) Co. app. 2
Moscow 115088, Russia
Phone/Fax: (7-095) 789-8043, mobile (7-095) 729-8203
e-mail: info@minpro.ru, URL: http://www.minpro.ru
Dr. V.A. Kovalenker – winner of S.S. Smirnov prize of Russian Academy of Sciences:

Academician S.S. Smirnov’s prize of the Russian Academy of Sciences in 2003 was awarded to Dr. V.A. Kovalenker, head of minerography division of IGEM RAS and Professor of Moscow State Geological-Prospecting University for the series of papers on mineralogical-geochemical formation regularities of epithermal gold ores, their theoretical and practical importance.

Dear colleague and friend, please accept our heartiest congratulations.

Last publications of Dr. V.A. Kovalenker:
(1) Kovalenker V.A. Porphyry-epithermal ore-forming systems: contours of problem // Proceedings of International Scientific-Technical Conference "Problems of ore deposits and maximizing the prospecting efficiency". Tashkent: IMR, 2003, p.148-149.
(2) Kovalenker V.A., Plotinskaya O.Yu., Prokof'ev V.Yu., Gertman Yu.L., Koneev R.I., Pomortsev V.V. Mineralogy, Geochemistry, and genesis of gold-sulfide-selenide-telluride ores from the Kairagach deposit (Uzbekistan). // Geology of Ore Deposits. 2003, v. 45, No 3, p. 171-200.

New members of the Russian IAGOD National Group:

Cherkasov, Sergey Vladimirovich, Ph.D., born 18.06.1959, head of International department, Vernadsky State Geological Museum, Mokhovaya Str., 11, bldg. 2, Moscow 125009, Russia, Tel: (7-095) 203-4667 (off.), Fax: (7-095) 203-5287, e-mail: sergy@sgm.ru.

Krivitskaya, Nadezhda N., Ph.D., senior scientist, Geological Faculty of Moscow State University, Lenin Hills, Moscow 119992, Russia. Tel. (7-095) 939-4959. E-mail: mkriv@geol.msu.ru. Major fields of interest – mineralogy and genesis of gold and silver deposits.

Marakushhev, Alexey Alexandrovich, Academician, Professor, principal scientist, IGEM RAS, Staromonetny Per., 35, Moscow 119017, Russia, tel. (7-495) 230-8228, e-mail: marakush@igem.ru, belova@igem.ac.ru.

Medvedev, Evgenii Ivanovich, born 23.12.1980, junior scientist, M.Sc., Ph.D. student, FEGI FEB RAS, Okeansky Prospect, 106/1, app. 26, Vladivostok, Russia, tel. (7-4232) 314-312, mobile: 8-924-233-0867, e-mail: cage21@mail.ru.

Orekhov, Alexander Alexandrovich, born junior scientist, Ph.D. student, FEGI FEB RAS, Prospect 100-letiya, 159, Vladivostok, 690022, Russia, tel. (7-4232) 317-293, fax: (7-4232) 317-847, e-mail: alexander_orekhov@yahoo.com.

Plyusnina, Laura Pavlovna, D.Sc., principal scientist of FEGI FEB RAS, Prospect 100-letiya, 159, Vladivostok, 690022, Russia, tel. (7-4232) 317-601, fax: (7-4232) 317-847, e-mail: lplyus@hotmail.com.

Prokofiev, Vsevolod Yu., D.Sc., leading research associate of IGEM RAS, Staromonetny Per., 35, Moscow 119017, Russian Federation. Tel. (7-095) 230-8444 (off.), fax: 230-2179, e-mail: vpr@igem.ru. Major fields of interest and expertise – fluid inclusion and melt inclusion studies of mineral deposits.

Rogulina, Larisa Ivanovna, Ph.D., senior scientist of Amur Integrated Research Institute, FEB RAS, Relochny Per., 16, Magadan, 685000, Russia, Tel. (7-413-22) 301-13 (off), 550-87 (home), Fax: (7-413-22) 300-51, E-mail: savva@neisri.maganadan.ru.

Tkachev, Andrey Vladimirovich, Ph.D., senior scientist, Vernadsky state geological museum, Mokhovaya Str., 11/2, Moscow 103009, Russia, Tel: (70495) 292-0586, e-mail: tkachev@sgm.ru.

Zotov, Igor’ Alexandrovich, Ph.D., senior scientist, IGEM RAS, Staromonetny Per., 35, Moscow 119017, Russia, Tel: (7-495) 446-9959, e-mail: olimpus16@vandex.ru.

New addresses:

Akinfiev, Nikolay N., Chairman, the IAGOD Working Group on Thermodynamics of Natural Ore-Forming Fluids, Professor, D.Sc., leading research associate of IGEM RAS, Staromonetny Per., 35, Moscow 119017, Russia. Tel.: (7-095) 230-8231, fax: 230-2179, e-mail: akinfiev@igem.ru.

Goncharov, V.I., Academician, former Director of NEISRI, left Magadan for Vladikavkaz, North Ossetia Republic, North Caucasus, the details of his new address will be advised later.

New e-mail addresses and new positions of other Russian IAGOD members:

Antipin, V.S. – antipin@igc.irk.ru
Baskina, V.A. – baskin@orc.ru
Borisenko, A.S. – (Deputy Director, Institute of Geology, SB RAS, Novosibirsk) - borisenko@uiggm.nsc.ru
Distanov, E.G. – distanov@uiggm.nsc.ru
Eremin, N.I. – neremin@mail.ru
Report of the Russian Far East IAGOD Group for 2004-2005

The Russian Far East IAGOD Group being a part of the National IAGOD Group of Russian Federation consists of 18 members, who are research officer of the Far East Geological Institute/

The main events in activity of Far East Russian IAGOD group in 2004 were:

1. **2004 Interim IAGOD Conference:**

   Interim IAGOD Conference on Metallogeny of the Pacific Northwest: “Tectonics, Magmatism and Metallogeny of Active Continental Margins” had held successfully by the Far East Geological Institute (FEGI FEB RAS) in September 1-20, 2004 in Vladivostok (Russia).

   The Russian National IAGOD Group and the Far Eastern Branch of the Russian Academy of Sciences (FEB RAS) took an active part in the preparation of the conference. The Organizing Committee of the conference was chaired by Professor Alexander I. Khanchuk, Director of FEGI and Corresponding Member of the Russian Academy of Sciences.

   The IAGOD General Assembly on their meeting in Florence, August 2004, elected Prof. Khanchuk the IAGOD’s President for the period from 2004 to 2008.

   The conference was attended by 162 participants, representing research institutions and industry of Australia, Austria, Canada, Germany, Indonesia, Italy, Japan, Mongolia, Republic of Korea, Russia, United Kingdom and the USA. The conference programme included 8 scientific sessions and one subsection preceded by a half-day plenary session. Most reports were delivered within sessions: "Geodynamics and metallogeny", "Geochemical and geodynamic types of granites and their ore mineralization" and "Ore deposits: geological setting, structural features, ore composition, and genesis".

   The volume of 198 extended abstracts “Tectonics, Magmatism and Metallogeny” and the guidebook “Metallogeny of the Pacific Northwest: Tectonics, Magmatism and Metallogeny of Active Continental Margins” were published prior to the conference (in English).
The guidebook is of interest to applied geologists and those doing multi-disciplinary research. It provides detailed descriptions of 9 regions featuring the uniqueness and geological variety of the Russian Far East.

2. Participation in the International scientific conferences and symposia:
All members of the Russian Far East group participated into the 2004 Interim IAGOD Conference. A.I. Khanchuk and V.V. Ivanov took part in the Eighth Biennial SGA Meeting “Mineral Deposit Research: Meeting the Global Challenge” in Beijing, China, 18-21 August 2005.
V.G. Khomich took part in VI International Symposium “The Problems of Geological and Mineragenetic Correlations in the Contiguous Regions of Russia, China and Mongolia” in Chita, Russia, 11-15 October, 2005.
V.G. Sakhno, A.N Mitrokhin and others members our Far East group took part in VII International Interdisciplinary Scientific Symposium and International Geosience Programme (IGCP-476) “Regularities of the Structure and Evolution of Geospheres” Vladivostok, Russia, 20-24 September, 2005.

3. Selected publications 2004-2005:
Gonevchuk G.A., Seltmann R. Interim IAGOD Conference on “Metallogeny of the Pacific Northwest: Tectonics, Magmatism, and Metallogeny of Active Continental Margins” // Episodes. 2005. Vol. 20, nos. 1. pp. 1-3.
Gonevchuk V.G., Korosteleve P.G., Semenyak B.I. 2005. Genesis of Tigrinoe tin Deposit (Russia) // Geology of Ore Deposits, V. 47, № 3, p. 249-264
Annotation. The paper summarizes the results obtained by the authors and other researchers from the study of the Tigrinoe tin deposit located in North Primorye in the central part of the Sikhote-Alin accretionary-folded area. The Tigrinoe deposit has a relatively short-term history of development (about 5 m.y.) that characterizes the deposits genetically related with rhyolite (ongonite)-leucogranite (lithium-fluorine type) magmatic association, however, three stages of ore formation are clearly distinguished in it. Mineralogical-geochemical parameters of the stages distinguished and their relation with the ore-generating magmatism evolution are discussed. The authors propose a model of evolution of the deposit ore-magmatic system.
Gvozdev V.I. The Arminsky ore District // Tectonics, Magmatism and Metallogeny of Active Continental Margins. Interim IAGOD Conference on Metallogeny of the Pacific Northwest, Excursion Guidebook, Vladivostok. 2004. P. 87-97.
Ivanov V. V., Kolesova L. G., Khanchuk A. I., Akatkin V. N., Molchanova G. B., Nechaev V. P. Find of diamond crystals in Jurassic rocks of the meymechite-picrite complex in the Sikhote-Alin Orogenic Belt. // Doklady Akademii Nauk, 2005, Volume 404, No. 1, P.72-75 (in Russian. English language translation of the journal is available from Pleiades Publishing, Inc. Doklady Earth Sciences ISSN 1028-334X).
Khomich V.G., Vlasov N.G. The Pokrovska epithermal gold deposit/ Metallogeny of the Pacific Nortwest (Russian Far East): Tectonics, magmatism and metallogeny of active continental margins. Interim IAGOD Conference 1-20 September. Vladivostok. Russia. Excursion guidebook. Dalnauka Publishing House, Vladivostok, 2004. P. 72-86.
Khomich V.G., Rodionov A.N., Fatjanov I.I., Boriskina N.G., Ivin V.V. Noble–metal mineralization of Southwest Primorye and prospect of its estimation. // The Problems of Geological and Mineragenetic Correlation within Contiguous Territories of Russia, China and Mongolia: Proceedings of VI International Symposium. Chita (Russia), 11-15 October, 2005). Ulan-Ude: BNC SB RAS, 2005. P. 105-108 (in Russian)
Mitrokhin A.N., Semenyak B.I., Utkin V.P., Sorokin B.K., Gonevchuk G.A., Gonevchuk V.G., Kokorin A.M., Kokorina D.K., Korosteleve P.G., Gorelikova N.V. Structural, Geodynamical, and Geochemical Aspects of a Spatial Distribution for Tin within the Komsomolsk Ore District (Khabarovsk Territory, Russia) // The Problems of Geological and Mineragenetic Correlation within Contiguous Territories of Russia, China and Mongolia: Proceedings of VI International Symposium. Chita (Russia), 11-15 October, 2005). Ulan-Ude: BNC SB RAS, 2005. P. 86-89 (in Russian)
Pakhomova V.A., Zalishchak B.L., Odarichenko E.G., Lapina M.I., Karmanov N.S. Sapphires from the Nezametnoye deposit – granosyenite magma efflorescence. The 18th Biennial of ECROFI, Siena, July 6–9, 2005, http://www.unisi.it/eventi/ECROFIXVIII/abstract.htm
Rodionov S.M., Semenyak B.I., Zabrodin V.Yu. The Komsomolsk Ore District // Tectonics, Magmatism and Metallogeny of Active Continental Margins. Interim IAGOD Conference on Metallogeny of the Pacific Northwest, Excursion Guidebook, Vladivostok. 2004. P. 43-71.
Sakhno V.G., Matyunin A.P. Non-traditional sources of diamond-bearing rocks of the Khanka massif (Primorye, Russia). // Diamond Deposits Prediction and Prospecting: Past, Present and Future (Diamonds-50. Proceedings of the Conference dedicated to the 50th anniversary of the discovery of the first diamond-bearing kimberlite pipe “Zarnitsa” VSEGEI, St. Petersburg, 2004. P. 311-313

Sakhno V.G. Low-mantle Plumes: Interaction of the Iron-hydride Outer Core of the Earth and Mantle. // Regularities of the Structure and Evolution of Geospheres. Proceedings of VII International Interdisciplinary Scientific Symposium and International Geoscience Programme (IGCP-476. 2005. P.40-45. Vladivostok.

Semenyak B.I., Korostelev P.G., Kokorin A.M., Nedashkovsky A.P., Magazina L.O., Golovanova T.I., Ekimova N.I. 2005. Selenium Mineralization from Tin Deposits of Primorye. (Russia) // Geology of Ore Deposits,. V. 47, № 3, P. 284-296

In East Russia, selenium mineralization of various intensities is known in postmagmatic deposits of different genetic types and metallogenic signatures from Chukotka to South Primorye. It is concentrated, for the most part, in subsurface and hypabyssal deposits related with magmatic complexes of the mantle or mantle-crust origin. In this paper we give the results of the study of selenium mineralogy in two tin deposits of Primorye – Ternistoye and Iskra assigned to the chlorite type of the cassiterite-silicate formation. In these deposits, selenium is centered mainly in the products of the mineralization final stages that are largely enriched in bismuth. Selenium minerals proper are represented by laitakariite with different chemical composition.

Tishkina Vita, Zalishchak Boris, Pakhomova Vera, Lapina Marija. Opal from the Raduznoe Deposit (Primorsky Krai, Russia). The Journal of The Gemmological Association of Hong Kong 2004 - Volume XXV.

Utkin V. P., Mitrokhin A. N., Nevolin P. L., Sayyadyan G. R., Sorokin B. K. A Structural–Geodynamic Factor in the Distribution of Gold Mineralization in Southern Primorye // Doklady Earth Sciences. 2004. Vol. 395. No. 2. P. 153-156

Volokhin Yu.G., Khanchuk A.I., Ivanov V.V., Kazachenko V.T., Sattarova V.V. Geochemistry and gold content of the Triassic carbonateous cherts of the Sikhote-Alin, Russia // Mineral Deposit Research: Meeting the Global Challenge. Jingwen Mao, Frank P. Bierlein (Eds.) Proceedings of the Eighth Biennial SGA Meeting Beijing, China, 18-21 August 2005. Springer. V. 1. P. 187-190.

Contributed by Secretary: of the Russian Far East IAGOD Group G.A. Gonevchuk, Far East Geological Institute of FEB of Russian Academy of Sciences. 159, Prospect 100-letiya, Vladivostok, 690022, e-mail: gonevchuk@hotmail.com

Report of the Kazakhstan National IAGOD Group for 2004

32nd International Geological Congress activity (Italy, 2004)

For 32nd IGC, three special books have been published with participation of Kazakhstan IAGOD members Kh.A. Bespaev (editor and co-author), V.L. Los (editor and co-author), O.A. Fedorenko, B.A. Dyachkov, M.S. Rafailovich, E.M.Sapargaliev (authors, co-authors).

Geosciences in Kazakhstan (Reports of Kazakhstani Geologists). Almaty, Kazakhstan Geological Society "KazGEO", 2004. 378 p. (In Russian).

This volume contains 50 articles reflecting the important geological investigations in Kazakhstan. The book includes some sections: geological service and mineral resources; geology, geodynamics and general minerageny; special minerageny and mineral resources; models, methods, technologies; hydrogeology; protection and safety of the Earth. The history of Kazakhstan geologists' participation in IGC and the role of international cooperation and scientific contacts in the development of national geology are characterized. The problems of geology, geodynamics, general and special minerageny of Kazakhstan, the general condition of mineral base are analyzed. The actual questions of groundwater formation in different settings and the earth protection are covered. The influence of the current processes on ecology of environment is analyzed.

Geology of Kazakhstan. Almaty, 2004. 480 p. (In Russian).

Volume of 48 transactions dedicated to the 32nd IGC reflects modern state of Earth science in Kazakhstan. The analysis of achievements in fundamental and applied sciences in field of Earth evolution and cognition of the regularities of forming mineral deposits opens the volume.
Actual questions of Regional Geology and Tectonics connected with the problems of Quaternary period, biostratigraphy of the Paleozoic deposits, stage zonal subdivision of Middle-Upper Cambrian are grounded. In Magmatism the main attention is paid to the petrology of diamond-bearing metamorphic rocks and petrological geodynamic models of endogenic ore formation. Metallogeny gives the original materials on the geodynamics of mineral deposits and metallogenic zones, ore-bearing metallogenic complexes, gold-bearing fluidites, geochemical zoning of metallogenic provinces. Reports on Oil and Gas cover oil and gas-bearing systems of sedimentary basins of Kazakhstan sector of the Caspian Sea, oil and gas content of the rift zones and the perspectives of the geodynamic monitoring of oil and gas deposits. Seismology shows geodynamic basis of the seismic process in mountain belts, meaning of neotectonics and orogeny in solution of problems of seismic activity.

Atlas of Mineral Deposit Models of Kazakhstan. Almaty, K.I. Satpaev Institute of Geological Sciences, 2004. 141 p. (In English, in Russian).

The Atlas presents geological-genetic and applied models for the main deposit types of Kazakhstan, including 44 deposits of metallic and non-metallic mineral resources (ore, diamonds and industrial minerals), fuel and energy resources (hydrocarbons and uranium deposits). The geological models developed by Kazakh geologists are based on examples from studied deposits and ore fields. These models utilize complex information in order to predict the parameters and scales of accumulation and conditions of formation of mineral resources. Models permit a focused approach to be used in metallogenic analysis, prognosis and prospecting of deposits.

The all three books were presented in the Geoexpo-2004.

Cooperation with other IAGOD National Groups (Kyrgyz, Uzbekistan, Russia, China et al.). The active form of Kazakhstan IAGOD Group activity was a presentation of international project on geology, geodynamics and minerageny of folded belts and sedimentary basins of Central Asia (a coordinator is an Institute of Natural Resources YUGGEO, Kazakhstan). There were presented and discussed original mineragenic, palinspastic, geodynamic, structural and lithology-paleogeographical maps, lithology-stratigraphical sections, forecast-exploration and genetic models of ore regions and deposit in Geoexpo-2004.

More than 15 abstracts of Kazakhstan IAGOD group members were accepted by the IGC Organizing Committee. Kazakhstan delegation in Italy included six National IAGOD members (Kh.A. Bespaev, O.A. Fedorenko, B.A. Dyachkov, V.F. Dolgopolov, M.S. Rafailovich, V.I. Serykh). They presented 10 oral and poster reports in the sphere of geology, minerageny and genesis ore and non-ore deposits.

Other Conference participation in 2004 (IAGOD members participating with oral presentation are indicated in brackets):

1. XXXVII Tectonic Conference "Evolution of Tectonic Processes in Earth History". Novosibirsk, Russia, 10-13 February 2004 (B.A. Dyachkov).
2. International Conference "Exploration Geochemistry: Theoretic Base, Technologies, Results". Kokshetau-Borovoye, Kazakhstan, 23-24 February 2004 (O.A Fedorenko, B.A. Dosanova, V.L. Los, M.S. Rafailovich, L.A.Yartseva).
3. International Conference "Global Mineral Resources Assessment Project. The Inaugural Central Asia Workshop". Almaty, Kazakhstan, 4-6 April 2004 (O.A Fedorenko, M.S. Rafailovich, V.I. Serykh).
4. International Workshop on Central Eurasia Geological Map Compilation. Urumqi, China, 10-17 May 2004 (B.A. Dyachkov, O.A Fedorenko, M.S. Rafailovich).
5. International Conference "Contemporary Issues of Uranium Mining Industry". Almaty, Kazakhstan, June 2004 (V.F. Dolgopolov).
6. International Conference "Modern Technologies of Mining and Production of Non-Ferrous Metals". Ust-Kamenogorck, Kazakhstan, 23 June 2004 (E.M. Sapargaliev).
7. Second International Economic Congress. Karaganda, Kazakhstan, 14-15 October 2004 (V.I Serykh, I.V. Glukhan).

Selected publications

Bespaev Kh.A., Zhukov N.M. (2004). Forming Models of Various Ore Types of Zhyngarsky Alatau. – In: Proceedings of National Academy of Sciences of Kazakhstan. Geological Series. № 3-4, 86-100.

Bespaev Kh.A., Puchkov E.V., Kovrigo O.A. (2004). Geodynamics and Metallogeny of Platinum of Kazakhstan. – In: Proceedings of National Academy of Sciences of Kazakhstan. Geological Series. № 3-4, 100-110.

Bespaev Kh.A., Polyansky N.V., Sapargaliev E.M. (2004). Geodynamics Evolution and Metallogeny of Devonian Paleostucture of Rudny Altay. – In: Geology of Kazakhstan. Almaty, Kazakhstan, 188-196.

Dolgopolov V.F., Petrov N.N. (2004). Precious Metals in Exogenic Uranium Deposits of Kazakhstan. – In: Contemporary Issues of Uranium Mining Industry. Almaty, Kazakhstan, 116-117.

Dyachkov B.A., Nikitina T.M., Maiorova N.P. (2004). Rare Metal Ore Magmatic Systems of East Kazakhstan. – In: Geology of Kazakhstan. Almaty, Kazakhstan, 222-229.

Dyachkov B.A., Maiorova N.P., Mochalkina L.N., Nikitina T.M. (2004). Magmatic Rocks and Metallogeny of Boundary Zone of Kazakhstan and Gornoaltay Continental Margins. – In: Geosciences in Kazakhstan. Almaty, Kazakhstan, 191-196.

Loktionov A.A., Argynova A.X., Los V.L., Tokarsky E.A. (2004). New Methods for the Forecast of Minerals. – In: Geosciences in Kazakhstan. Almaty, Kazakhstan, 239-251.
Los V.L., Goldberg I.S. (2004). Geochemical Searches of Latent Ore Deposits: Basic Model, Technology, Organization. – In: Exploration Geochemistry: Theoretic Base, Technologies, Results. Almaty, Kazakhstan, 42-58.

Los V.L. (2004). Theoretical, Methodical and Technological Basis of Forecast of Ore Deposits. – In: Geosciences in Kazakhstan. Almaty, Kazakhstan, 228-239.

Rafailovich M.S. (2004). Non-Traditional Types of Gold Deposits in Kazakhstan. – In: Ores and Metals, № 2, 25-35.

Rafailovich M.S., Golovanov I.M., Fedorenko O.A., Nikonov V.V. (2004). Geological and Geochemical Features of Giant Gold Deposits in Black Shales of Central Asia. – In: Exploration Geochemistry: Theoretic Base, Technologies, Results. Almaty, Kazakhstan, 67-83.

Rafailovich M.S., Fedorenko O.A., Arefyev (2004). Vasilkovskoye Stockwork Gold Deposit. – In: Atlas of Mineral Deposit Models of Kazakhstan. Almaty, Kazakhstan, 58-61.

Sapargaliev E.M., Kravchenko M.M., Dyachkov B.A. et al. (2004). Great Altay (Geology and Metallogeny). Non-Metallic Minerals. Almaty, Kazakhstan. 304 p.

Sapargaliev E.M. (2004). Bentonites of Taganskoye Deposit as Perspective Raw Material for Economics of Kazakhstan. – In: Geology of Kazakhstan. Almaty, Kazakhstan, 302-307.

Serykh V.I. (2004). Geology, Petrology and Metallogeny of Ultraacid Granitoids of Central Kazakhstan. – In: Scientific Transactions of Karaganda University of Business, Management and Low. Karaganda, Kazakhstan. Vol. X, 68-93, Vol. XI, 74-104.

Uzhkenov B.S., Mazurov A.K., Bykadorov V.A., Smirnov A.V., Fedorenko O.A. (2004). Paleogeography and Geodynamics of Kazakhstan and Neighbouring Territories. – In: Geosciences in Kazakhstan. Almaty, Kazakhstan, 39-54.

Yartseva L.A., Volkova T.A., Kusherbaev Zh. P. (2004). Gold-Platinum Metallogeny of Shu-Ili Paleoriftic and Plume System. – In: Geology and Metallogeny of Ultramafic-Mafic and Granitoid Associations of Folded Regions. Ekaterinburg, Russia, 305-308.

Yartseva L.A. et al. (2004). Platinum of Shu-Ili Region on the Base of Regional Geochemical Mapping of New Generation. – In: Exploration Geochemistry: Theoretic Base, Technologies, Results. Almaty, Kazakhstan, 160-168.

**Report of the Kazakhstan National IAGOD Group for 2005**

**Conference participation in 2005** (IAGOD members participating with oral presentation are indicated in brackets):

1. International SGA Meeting, Beijing, China, 18-21 August 2005 (A. V. Dolgopolova).
2. International Conference "Placers and Weathering Crust Deposits: Facts, Problems, Decisions". Perm, Russia, 22-26 August 2005 (B.A. Dyachkov).
3. International Biochemical School “Actual Problems of Geochemical Ecology” Semipalatinsk, Kazakhstan, 8-11 September 2005 (E.M. Sapargaliev).
4. International Conference “Precious and Rare Metals of Siberia and Far East”. Irkutsk, Russia, 3-7 October 2005 (M.S. Rafailovich).
5. International Scientific-Practical Conference “Technics and Technologies for Protection of Environment”. Ust-Kamenogorsk, Kazakhstan, 4-5 October 2005 (B.A. Dyachkov, E.M. Sapargaliev).
6. Scientific Conference “Geology and Prospecting Problems of Mineral Deposits”. Tomsk, Russia, 11-14 October 2005 (V.L. Los).
7. Working Meeting “GIS-Atlas of Geological Maps of Russia and Neighbouring States”. Saint-Petersburg, Russia, 22-24 November 2005 (O.A. Fedorenko).

**Participation in International Projects**

Kazakhstan National IAGOD Group members O.A. Fedorenko and M.S. Rafailovich are Leaders of International Project “Geology, Geodynamics and Metallogeny of Central Eurasia”. O.A. Fedorenko, coordinator, took part in conference of countries-executors of that project (Saint-Peterburg, Russia, 15-16 June 2005)

**Selected publications**

Dolgopolova A.V., Seltmann R., Kober B., Weiss D., Stanley C., Dulski P. (2004). Geochemical Characteristics and Pb Isotope Systematics of Highly Fractionated Li-F Enriched Amazonite Granites and Related Host Rocks of the Orlovka-Spokoinoe Mining District, Eastern Transbaikalia (Russia). Trans. Inst. Min. Metall.: Section B. Applied Earth Science 113 (1), 83-99.

Dolgopolova A.V., Weiss D., Seltmann R., Kober B., Stanley C. (2005). Use of Pb and Zn Isotope Systematics to Assess Metal Sources within the Orlovka-Spokoinoe Mining Site. Salt Lake City Annual Meeting (October 16-19, 2005), Abstract Volume, Paper No. 215-3.
Dolgopolova A.V., Seltmann R., Stanley C., Weiss D., Kober B., Siebel W. (2005). Isotope Systematics of Ore-bearing Granites and Host Rocks of the Orlovka-Spokoinoe Mining District, Eastern Transbaikalia (Russia). – In: J. Mao, F.P. Bierlein. Mineral Deposit Research: Meeting the Global Challenge. Springer, 747-750.

Dyachkov B.A., Ganzhenko G.D., Maiorova N.P. (2005). Geodynamic Settings and Ore-Bearing of Magmatic Rocks of Great Altay and Neighbouring Territories. – In: Magmatic and Metasomatic Formations and Related Ore Deposits. Tashkent, Uzbekistan, 107-111.

Dyachkov B.A. (2005). Perspectives of Consolidation of Mineral Raw Base in Altay-Chingiz Region (East Kazakhstan). – In: Proceedings of National Science Academy of Kazakhstan. Geological Series. № 2, 63-79.

Dyachkov B.A., Titov D.V. (2005). Restored Models of Ore Region of Great Altay. – In: Geology and Protection of Resources. № 3, 12-19.

Los V.L. (2005). Self-Organization in Geological Systems: General Principles, Metallurgical and Applied Results. – In: Geology and Protection of Resources. № 1, 75-80.

Los V.L. (2005). Forecast of Mineral Deposits: Theoretic-Methodological, Technological and Organizational Aspects. – In: Geology and Prospecting Problems of Mineral Deposits. Tomsk, Russia, 294-298.

Marchenko L.G., Yartseva L.A. (2005). Perspectives of Black Shales in Kazakhstan. – In: Geology and Prospecting Problems of Mineral Deposits. Tomsk, Russia, 529-531.

Rafailovich M.S. (2005). Non-Traditional Endogenic and Exogenic Gold Deposits of Kazakhstan. – In: Precious and Rare Metals of Siberia and Far East. Irkutsk, Russia, 91-94.

Rafailovich M.S., Los V.L. (2005). Large Gold Deposit Akbakay: Mineral-Geochemical Zonality, Structure of Gold Distribution, Forecast-Prospecting Model. – In: Geology and Protection of Resources. № 3, 33-41.

Rafailovich M.S., Starova M.M, Stepanov N.N., Maximov N.S., Alexeev Yu. A. (2005). Ashiktas Type of Volcanogenic Au-Ag Deposits in Kazakhstan. – In: Ore and Metals. №3, 15-22.

Sapargaliev E.M., Dyachkov B.A. et al. (2005). Ecologization of Landscape and Geochemical Setting in Ust-Kamenogorsk. – In: Geology and Protection of Resources. № 3, 12-19.

Planned activities for 2006

1. New publications (monographs, articles, methodical recommendations) in the sphere of the geology and genesis of ore deposits (national and international magazines).
2. Organization and participation in International Scientific Meetings, Conferences and Field Excursions (Kazakhstan, Russia, China and others).
3. Cooperation with other IAGOD National Groups (Kyrgyz, Uzbekistan, Russia, China et al.) on the basis of International project “Geology, Geodynamics and Metallogeny of Central Asia”.

Current list of members of the Kazakhstan IAGOD National Group (January 2006)

Chairman: Prof. Mikhail Rafailovich (Scientific Institute of Natural Resources YUGGEO, Shevchenko Str., 162 zh, 050008, Almaty, Republic of Kazakhstan. Tel.: (3272) 684098; fax (3272) 686369; e-mail: rafail@nets.kz).

Prof. Bespaev Kh.A. (Almaty), Dr. Dolgopolov V.F. (Almaty), Dr. Dolgopolova A.V. (London), Prof. Dyachkov B.A. (Ust-Kamenogorsk), Dr. Fedorenko O.A. (Almaty), Dr. Glukhan I.V. (Karaganda), Prof. Los V.L. (Almaty), Prof. Serykh V.I. (Karaganda), Dr. Sapargaliev E.M. (Ust-Kamenogorsk), Dr. Usoltsev I.I. (Almaty), Dr. Yartseva L.A. (Almaty).

New members of Kazakhstan National IAGOD Group

Dolgopolova Alla Vladimirovna, Center for Russian and Central Eurasian Mineral Studies (CERCAMS), Department of Mineralogy, Natural History Museum. Cromwell Road, London SW7 5BD, UK, Tel: + 44 (0) 207 942 6009; Fax: + 44 (0) 207 942 6012; E-mail: allad@nhm.ac.uk.

Usoltsev Igor Ivanovich, K.I. Satpaev Institute of Geological Sciences. Kabanbay Batyr Str. 69-a, Almaty, 050000, Kazakhstan, Tel: (3272) 914750; Fax: (3272) 915805, E-mail: bespaev@nets.kz.

Contributed by Mikhail Rafailovich, chairman, e-mail: rafail@nets.kz.
IAGOD National Group of Kyrgyzstan

Chairwoman: Djenchuraeva Rosalia J. (Corr. Member of NAS, Prof., Institute of Geology National Academy of Sciences, 30 Erkindik, 720481 Bishkek, Kyrgyzstan; tel. 996 (312) 42 15 07; 66 26 80; Fax: 996 (312) 68 00 47; E-mail: djam@freenet.kg;

Loss of member: Turdukeev, Iskander (IG NAS) deceased in 2003;

New IAGOD member: Djenchuraeva Alexandra V., Full.doctor, professor, chief of the Stratigraphy and Paleontology department of SAG&MR

Recent papers (2003)

Djenchuraeva R. Deep Earth heterogeneities and their role in the formation of large ore deposits//Izvestia Natsionalnoy Academiy Nauk (Proceedings of the National Academy of Sciences of Kyrgyz Republic), №4, 2003, pp.18-27 (in Russian)

Maksumova R., Djenchuraeva R. Tectonic zoning and Tien Shan’s caledonides metallogeny //Ibid. Pp.59-73. (in Russian)

Bakirov A., Sakiev K. The role of ophiolites in the formation of the earth crust and modern views on the geodynamic of Tien Shan //Ibid. pp.32-36 (in Russian)

Pak N. Auriferous metasomatites and their predicting-searching value //Ibid. pp.101-105 (in Russian)

Usmanov I. The new type of polygenic ore deposit in gold-bearing object Kok-Djar //Ibid. pp.105-109 (in Russian)

Aitmatova Dj. On the concentration of heavy and radioactive elements in human biosubstrata (taking area of mining enterprises of Fergana valley as an example). //Nauka I Novye Tekhnologii (Science and New Technologies). - №3. - Bishkek. - 2003. - Pp. 71-83. (in Russian)

Aitmatova Dj. Tailing sites and their impact on the environment on the territory of uranium mines of Mailuu-Suu and Charkesar. (Co-authorship V.B.Aparin). // Nauka I Novye Tekhnologii (Science and New Technologies). - №3. - Bishkek. - 2003. - Pp. 21-35. (in Russian)

Aitmatova Dj. Issues of environmental security while rock movements controlled from the space in environmentally hazardous areas of Tien Shan mountains. (Co-authorship A.N.Valyev, S.V.Kazakov, I.T.Aitmatov// Earth from the Space: the most effective solutions//Abstracts of an International Conference. – Moscow. - Russian Federation. - 2003. (in Russian)

Report of the Kyrgyzstan National IAGOD Group for 2003-2005

IAGOD National Group of Kyrgyzstan (19 members)

Chairwoman: Djenchuraeva Rosalia J. (Corr. Member of NAS, Prof., Institute of Geology National Academy of Sciences, 30 Erkindik, 720481 Bishkek, Kyrgyzstan; tel. 996 (312) 66 21 89; 66 26 80; Fax: 996 (312) 68 00 47; E-mail: djam@mail.kg; rosaliad@mail.ru;

Aitmatova, Djamila (Inst. Physics&Rock Mechanics, NAS), Bakirov, Apas (IG, NAS), Bogdetsky, Valentin (CVP), Djenchuraeva Alexandra V. (IG NAS), Kabaev, Omorkul (MRI), Kim, Vlas (KMMI), Maksumova, Rena (IG NAS), Malyukova, Nataly (KRSU), Mikolaiuchuk, Alexander (IHT), Nikonorov, Valentin (SAG&MR), Osmonbetov, Kubat (KMMI), Pak, Nikolay (IG NAS), Shamsheyev, Orunbay (OTU), Savchenko, Gennady (SAG&MR), Stavinsky, Vitaly (KMA), Usmanov, Iltyzar (IG NAS), Yakimov, Viktor (ME&ES), Usbalanced, Tourat (KOC).

Members Left (from the Kyrgyz Republic):

Litvinov, Pavel
Sorokin, Timofey
Yarkov, Alexander

New IAGOD member: Djenchuraeva Alexandra V., Full Doctor, Chief of the Stratigraphy and Paleontology department of SAG&MR, professor of KRSU.
Explanations: CVP – Counselor of Prime Minister KR; 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; KRSU – Kyrgyz-Russian Slavic University, 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 Technical Univers., town Osh.

E-mail addresses of Kyrgyz Group IAGOD Members:
Aitmatova, Djamila    djam@mail.kg; Fax: 996 (312) 541117;
Bakirov, Apas       geol@aknet.kg; Fax: 996(312) 664256;
Litvinov, Pavel   Pavel_Litvinov@kumtor.com
Maksumova, Rena    rmaks@geol.freenet.bishkek.su
Malyukova, Nataly   nnn333@mail.ru
Mikolaichuk, Alexander   mav@tiger.gdirc.ru; IVTANgora@mail.ru
Pak, Nikolay    geol_pak@netmail.kg
Usmanov Iltizar   iltizar@yandex.ru

Most important among recently published papers:
Aitmatova Dj. Environmental and Human Impact of mining industry in mountains around of North Fergana Valley (Mailuu-Suu, Sumsar, Chadak, Charkesar mines case studies). Ph.D., Bishkek. 2004, 152 p.
Aitmatova Dj. Technogenic activities impact on ground and surface water in the vicinities of Mailuu-Suu and Sumsar dormant mines (South Kyrgyzstan)// Proceedings of International conference “Ground Water and their use perspectives”. - Tashkent. –2005, p. 93-100.
Bakirov A. Petrologic interpretations of composition and condition of deep substrate layers of lithosphere and geodynamic effects// Modern geodynamics of intercontinental collision orogeny (Central Asia). Moscow: “Nauchny mir” Publishing House, 2005, p.318-327.
Bakirov A. Noosferology. – Bishkek. - Publishing House of Kyrgyz State Agency of Intellectual Property. 283 p. (in print, in Russian).
Bakirov A., Sakiev K. Low Precambrian of Tien Shan (Kyrgyzstan). “Precambrian Continental Growth & Tectonism” (PCGT–2005), India, 2004. Pp.149-151.
Djenchuraeva R, Nikonorov V., Karaev Y. Atlas of mineral deposit types of Kyrgyzstan. 2005, 30 p. (English-Russian version, A-3 format).
Djenchuraeva R, Pak N., et.al. Geology of gold deposits in Kyrgyzstan// Papers collection, “Ilim” Publishing House, 2005, 216 p. (in print, in Russian).
Maksumova R., Bakirov A. Major peculiarities of pre-Orogenic substrate// Monograph “Modern geodynamics of intracontinental mountain formation areas”. Moscow, “Nauchny Mir” Publishing House, 2005.
The Excursion Guidebook ‘Geodynamics and Metallogeny of Mongolia’ published. Seltmann, R., Gerel, O, & Kirwin, D (Eds) Geodynumics and Metallogeny of Mongolia with a special Emphasis on Copper and Gold Deposits. IAGOD Guidebook series 11, London 2005. 225 p. ISBN 5-8198-0075-3

ATTENDANCE IN OTHER INTERNATIONAL PROJECTS

- Mineral Resources, Metallogenesis and Tectonics of Northeast Asia international collaborative project. Open-file reports: Preliminary Publication Book 2 and Significant metalliferous and selected non-metalliferous lode deposits, and selected placer districts for Northeast Asia are published in 2003.
- Geomap-200. Members of IAGOD group are involved and are leaders of this ongoing project. The first version of 1:200 000 map discussed and proved.

Field work:
- Field trip to Altai area organized by IAGOD National group (Prof. S. Dandar)
- Field trip to Orkhon-Selenge depression (led by G. Dejidmaa)
- PGE filed trip to Mongolian Altai (D. Delgertsogt)
- Two filed trips to Ardent deposit (O. Gerel, B. Munkhtsengel)

SELECTED PUBLICATIONS OF THE NATIONAL GROUP

Batkhishig, B. Bignall, G. and Tsuchiya, N. 2004. Geofluid dynamics revealed by coupled study of fluid inclusion and SEM-CL in the Shuteen mineralized Complex, South Gobi, Mongolia. Proceedings of 2nd International Workshop on WATER DYNAMICS, Tohoku University, Sendai, Japan, 11-12 November, 2004.

Batkhishig, B. Bignall, G. and Tsuchiya, N. 2005. Hydrothermal Quartz Vein Formation Revealed by Coupled SEM-CL Imaging and Fluid Inclusion Microthermometry: Shuteen Complex, South Gobi, Mongolia. Recourse Geology, vol. 55, no. 1, p. 1-8.

Batulzii D., Khishigsuren S., Tumurchuder Ch 2005. Hangay complex granitoid geochemistry and geodynamic setting. Geology, Ulaanbaatar. No. 13, 68-70

Ukhnaa, G., Narantuya, P., Jargalan, S., Danadar, S. Preliminary results of geochemical study at gold deposit area. Geology, Ulaanbaatar, No. 10, 100-106.

Bignall, G. Batkhishig, B. Tsuchiya, N. Delgertsogt, B. The Shuteen Cu-Au porphyry deposit Geodynamics and Metallogeny of Mongolia” published. Seltmann, R., Gerel, O, &Kirwin, D (Eds) Geodynamics and Metallogeny of Mongolia with a special Emphasis on Copper and Gold Deposits. IAGOD Guidebook series 11, London

Gerel, O., Dandar, s., Amar-Amgalan, S., Javkhlanbold, D., Myagmarsuren, Se., Myagmarsuren, Sa, Munkhtsengel, B., Soyolmaa, B. 2005. Geochemistry of granitoids and altered rocks of the Ardent porphyry copper-molybdenum deposit, Central Mongolia. Mineral Deposit Research: Meeting the Global Challenge, Vol. 2. Springer, 1137-1140

Gerel, O., Amar-Amgalan S., Myagmarsuren, S., Kirwin, D., Armstrong, R., Herrington, R., Seltmann, R. 2005. Granitoids and related mineralization in Mongolia:petrochemistry and mineral deposits GIS. Mineral Deposit Research: Meeting the Global Challenge, Vol. 2. Springer, 1137-1140

Gantumur, H., Batulzii, D., Wang Lijuan, Zhu Heping. 2005. Tsav: a shoshonite-hosted intermediate sulfidation epithermal Ag-Pb-Zn deposit, eastern Mongolia. Mineral Deposit Research: Meeting the Global Challenge, Vol. 1. Springer, 389-302

Dejidmaa, G. Mineral resources and metallogenic belts in Southern Mongolia Geodynamics and Metallogeny of Mongolia” published. Seltmann, R., Gerel, O, &Kirwin, D (Eds) Geodynamics and Metallogeny of Mongolia with a special Emphasis on Copper and Gold Deposits. IAGOD Guidebook series 11, London

Dejidmaa, G. Badarch G. 2005. Summary of pre-accretionary and accretionary metallogenic belts of Mongolia. Geodynamics and Metallogeny of Mongolia” published. Seltmann, R., Gerel, O, &Kirwin, D (Eds) Geodynamics and Metallogeny of Mongolia with a special Emphasis on Copper and Gold Deposits. IAGOD Guidebook series 11, London

Dejidmaa, G., Dorjigotov, D. Gerel, O. Gotovsuren. 2005. A Preliminary description of mineral deposit models (types) for Mongolia. Geodynamics and Metallogeny of Mongolia” published. Seltmann, R., Gerel, O, &Kirwin, D (Eds) Geodynamics and Metallogeny of Mongolia with a special Emphasis on Copper and Gold Deposits. IAGOD Guidebook series 11, London

Gerel, O., Myagmarsuren, S., Amar-Amgalan, S., Munkhtsengel, B., Batkhishig, B., Oyuga, Gerel, S. 2005. Granitoids of Mongolia: Gis petrological database. Mongolian Geoscientist, April 2005, 121-127.

Gerel, O. Munkhtsengel, B. Einkhtuvshin, H. Iizumi, Sh. Mushgai Khudag and Bayan Khoshuu volcanic-plutonic alkaline complexes with REE ±Ta, Nb, Fe carbonatite mineralization Geodynamics and Metallogeny of Mongolia” published. Seltmann, R., Gerel, O, &Kirwin, D (Eds) Geodynamics and Metallogeny of Mongolia with a special Emphasis on Copper and Gold Deposits. IAGOD Guidebook series 11, London

Gerel, O. Munkhtsengel, B. Erdenetin Ovoo porphyry copper-molybdenum deposit in northern Mongolia Geodynamics and Metallogeny of Mongolia” published. Seltmann, R., Gerel, O, &Kirwin, D (Eds) Geodynamics and Metallogeny of Mongolia with a special Emphasis on Copper and Gold Deposits. IAGOD Guidebook series 11, London

Gerel, O. Oyungeber, S. Minjin, Ch. Intrusive magmatism of South Mongolia Geodynamics and Metallogeny of Mongolia” published. Seltmann, R., Gerel, O, &Kirwin, D (Eds) Geodynamics and Metallogeny of Mongolia with a special Emphasis on Copper and Gold Deposits. IAGOD Guidebook series 11, London
Munkhtsengel, B. Iizumi, Sh. Petrology and geochemistry of the Lugiin gol nepheline syenite complex, South Mongolia Geodynamics and Metallogeny of Mongolia” published. Selmann, R., Gerel, O., & Kirwin, D. Eds Geodybamics and Metallogeny of Mongolia with a special Emphasis on Copper and Gold Deposits. IAGOD Guidebook series 11, London Rodionov, S.M., Obolensky, A.A., Badarch. G., Dejidmaa, G., Distanov, E.G., Gerel, O., et al., Metallogenisis of northest Asia. Mineral Deposit Research: Meeting the Global Challenge, Vol. 2. Springer, 1157-1169 Tomurtogoo, O. 2005. Tectonics and structural evolution of Mongolia. Geodynamics and Metallogeny of Mongolia” published. Selmann, R., Gerel, O., & Kirwin, D. Eds Geodybamics and Metallogeny of Mongolia with a special Emphasis on Copper and Gold Deposits. IAGOD Guidebook series 11, London

IAGOD NATIONAL GROUP OF MONGOLIA: 36 MEMBERS

Chairwoman: Prof. Ochir Gerel (Dept. of Geology, Mongolian University of Science & Technology. P.O. 46, Box 520, Ulaanbaatar 210646, Mongolia. Tel: 976-11-326425; Fax: 976-11-312291; E-mail: gerel@must.edu.mn)

S. Dandar (Secretary, Mongolian University of Science & Technology), J. Lkhamsuren (Dept. of Geology, Mongolian University of Science & Technology), G. Dejidmaa (Geological Information Center), N. Amitan (Togs Buiant Ltd.), D. Bat-Ulzii (Dept. of Geology, Mongolian University of Science & Technology), J. Ganbold (Mongolian Academy of Science, Institute of Geology and Mineral Resources), B. Delgertsogt (Dept. of Geology, Mongolian University of Science & Technology), Sunjidmaa (Mineral Resource Authority of Mongolia), M. Todbileg (GQX Ltd.), D. Bold-Erdene (MinInfo Ltd.), H. Gantumur (Mineral Resource Authority of Mongolia), Sambuu Oyungerel (Geoscience Center, Mongolian University of Science & Technology), G. Ulkhnaa (Dept. of Mineral Exploration, Mongolian University of Science & Technology), H. Enkhutuvshin (Gallant Minerals Mongolia Ltd), S. Oyungerel (Dept. of Geology, National University of Mongolia), D. Dorjgotov (Dept. of Geology, National University of Mongolia), L. Jargal (Dept. of Geology, National University of Mongolia), Yo. Majigsuren (Mineralogical Museum, Mongolian University of Science & Technology), S. Myagmarsuren (Geoscience Center, Mongolian University of Science & Technology), S. Jargal (Dept. of Mineral Exploration, Mongolian University of Science & Technology), Batseren Soyolmaa (Geoscience Center, Mongolian University of Science & Technology), Sanjsuren Oyunbat (Geo-Info Co. Ltd., Mongolia), Namsraijav Baatar (Dept.of Mineral Exploration, MUST (Mongolian Alt Corporation, Mongolia), Batseren Soyolmaa (Geoscience Center, Mongolian University of Science & Technology), Sanjsuren Oyunbat (Geo-Info Co. Ltd., Mongolia), Namsraijav Baatar (Dept.of Mineral Exploration, MUST (Mongolian Alt Corporation, Mongolia)

New Member: Naidansuren Tungalag, Institute of Geology & Mineral Resources, Mongolian Academy of Sciences

Our Losses

Samdan DASHDAAVA, Professor, PhD, one of the first IAGOD member passed away on November 2005. S. Dashdavaa born on 1937 in Zavkhan aimag, Mongolia. He graduated in geology in 1963 the Mongolian State University. He received PhD degree from the Institute of Geochemistry and Mineral Physics, of the Ukranie Academy of Sciences in 1977. Honorary Professor of the MUST. He did a long carier started in 1963-1967 assistant prof., 1967-1971 head of the Dpartment , 1971-1972 dean, 1972-1982 head of the Educational Department of Polytechnic Institute and from1982-1992 vice-rector responsible for education. Since 1992-202 he was a head of Dept. of Geology and Mineralogy at Mongolian State University, since 2002 leading Professor. His scientific interest was W-Sn deposits, he published many papers and textbooks in Mineralogy and ore deposits. S. Dashdavaa was a member of many International and professional organization including the Mongolian Academy of Sciences, Mongolian Academy of Education, IAGOD vice-head of Scientific Council for PhD defense , member of the Scientific Council of the Mongolian Sate University.

Togookhuu SENGEDORJ. We loosed or new member who joined IAGOD group in 2003. T. Sengedorj graduated in 1971 from the Mongolian University of Science 7 Technology and started his job from 1971-1975 geologist, 1975-1981 senior geologist, 1981-1995 general geologist, 1995-1997 G&B company vice-director, 1997-2001 general geologist of Geological Research Center, 2001-2002 manager at the Ministry of Industry and Trade, 2002-2005 Mongolian Alt company director of exploration department. He provided geological exploration work in many area in Mongolia

Contributed By Ochir Gerel,chairwoman, E-mail:gerel@must.edu.mn
Report of the Tajikistan National IAGOD Group for 2003

The main activity of our group was aimed to collaboration with holders of the grant projects. At first it was Institute of Geography, University of Berne (Prof. Hans Hurni, Co-director of the Center for Development and Environment), which was involving us to the Pamir Strategy Project (PSP/CDE) for review on mineral deposits in Pamir Mountains, its economy profitableness and real significance. The result was collective compilations under consulting, editing and technical making of the TajikIAGOD group members:
- 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.Bahtdavlatoev, co-author/editor)
This matters were published briefly in: “Analysis of sustainable development in Pamir Mountains, Tajikistan” – Khorugh, 2002, p.p. 61-67, 76-80. The project was financed by Swiss Agency for Development and Cooperation; breu@giub.unibe.ch - PSP Coordinator.

Scientific collaboration with Germany and USA Universities is fruitful and moving along two items: a) deep-seated xenoliths from Neogene alkali basalt of East Pamir – Tibet (the problem of super-thick Earth Crust); b) magma belts of the Tien-Shan – Pamir – Tibet region. Supporting persons: Prof. Lothar Ratschbacher (Bergakademie Freiberg), Dr. Mihai Ducea (University of Arizona), Dr. Bradley Hacker (University of California). Valery Lutkov and Vladislav Minaev represent the TajikIAGOD group.

Some publications were made:
1. V.S.Lutkov, V.V.Mogarovsky, V.Ya.Lutkova. Geochemical model of Low Crust of the Pamir – Tien-Shan folding region (Tajikistan) under learning of xenoliths in alkali basalt. – Geochemistry, 2002, No 4, p.p. 386-398.
2. I.N.Matveeva. On genesis of boron-silicate-bearing Ak-Arhar deposit. – Proceedings of Geology Institute AS RT, new series, v.1. Dushanbe, 2002, p.p. 208-212.
3. V.E.Minaev. Geotectonic setting of schist belts in Tajikistan. – Proceedings of Geol. Institute AS RT, new series, v.1. Dushanbe, 2002, p.p. 109-118.
4. A.R.Fayziev, M.B.Samiev. Alteration in host rocks of the Big Kanimansur deposit (Northern Tajikistan). – Proceedings of Geology Institute AS RT, new series, v.1. Dushanbe, 2002, p.p. 161-171.
5. A.R.Fayziev, A.V.Koplus. Sodium and potassium in fluorite of different genesis from CIS endogenous deposits. – Proceedings of Geology Institute AS RT, new series, v.1. Dushanbe, 2002, p.p. 180-193.

An interesting application of Boris A. Revazov (member of TajikIAGOD group) is made for analytic control of dressing technology in Tajik-Canadian “Aprelevka Gold Deposit” Joint Venture. He suggests to analyze the gold of high content sorbed in activated coal (after CN-acid process) by express atom-absorption method. Decline of analytic time gives great economy effect due to special know-how based on 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). Sense of know-how is in scheme of the tested sample preparation and content of burned batch. The mode of gold-dressing control is profitable for dressing-plant’s expenditures through great economy of time.

Contributed by Vladislav Minaev, Chairman of TajikIAGOD group, geol@ac.tajik.net, f: +992 372 510037

Activities of the Georgian IAGOD National Group for 2003

The members of National Group took part in organization of the scientific session dedicated to 100-th birthday anniversary of Academician of Georgian Academy of Sciences P.Gamkrelidze. The session was held in 27-29 October, 2003, in Tbilisi and was hosted by Geological Institute of Georgian Academy of Sciences. On this session
different aspects of geology of the Caucasus, as well as adjacent areas were discussed. The proceedings of the session are in press.

Some members of the National Group participated 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”. The project has been successfully concluded in 2004.

Contributed by Ramaz Migineishvili, Chairman of the Georgian IAGOD Group, Geological Institute of Georgian Academy of Sciences, 1/9 M.Alexidze str., 0193 Tbilisi GEORGIA, e-mail: ram_migi@yahoo.com

Report of the Georgian IAGOD National Group for 2004-2005

Some members of the National Group (Kekelia S., Kekelia M., Gugushvili V.) are participating in the following scientific projects:

1. Metallogeny and resource evaluation of volcano-plutonic complexes in the Pontide-Lesser Caucasus island arc, Georgian Research & Development Foundation, U.S. Civilian Research & Development Foundation, Georgian-U.S. Bilateral Grants Program, GEG2-3324-TB-02 (2005-2006)

2. Development of genetic and exploration models to aid in exploration, development, and environmental mitigation of gold-bearing deposits of the Lesser Caucasus (2005-2007), U.S. Civilian Research & Development Foundation, South Caucasus Cooperative Research Program, SCI-010000-SC-05 (2005-2007)

3. Geology and gold favorability of carbonaceous metasedimentary rock sequences of the Southern Slope Zone, Greater Caucasus, Republic of Georgia, Georgian Research & Development Foundation, U.S. Civilian Research & Development Foundation, Georgian-U.S. Bilateral Grants Program, 3300 (2003-2004)

Recent Publications:

Abesadze M., Kekelia M., Tsimakuridze G., Chkotua T., Shavishvili I., (2004) Petrogeochemical peculiarities of metabasites of Kassare complex of the Main range of the Greater Caucasus. Proc Geol Inst Georgian Acad Sc., New series, v. 119. p.496-502. (in Russian with English abstract).

Buadze V. (2004) Common geodynamic conditions and inner geodynamics of gold ore formation (on the example of Georgia and other regions). Proc Geol Inst Georgian Acad Sc., New series, v. 119. p.728-737. (in Russian with English abstract).

Gugushvili V. (2004) Two types of gold mineralization in the Bolnisi mining district related to Cretaceous volcanism. Proc Geol Inst Georgian Acad Sc., New series, v. 119. p.749-754.

Kekelia S., Kekelia M., Otkhmezuri Z., Moon Ch. (2004) Metallogeny of active paleomargins of continents (on example of Alpine metallic deposits of Caucasus and Pontides). Proc Geol Inst Georgian Acad Sc., New series, v. 119. p.706-727

Migineishvili R. (2004) Description and typification of the Madneuli copper-zinc deposit (Georgia). Proc Geol Inst Georgian Acad Sc., New series, v. 119. p.755-769. (in Russian with English abstract).

Tsimakuridze G., Akhvlediani R., Kekelia M., Shvelidze I. (2004) Resistors in the infrastructure of the Main Ridge of the Greator Caucasus. Proc Geol Inst Georgian Acad Sc., New series, v. 119. p.454-461 (in Russian with English abstract).

Kekelia S., Kekelia M., Atasiani G., Gigiadze G., Shavishvili I. (2005) Gold potential of Georgia. Gornyi Zhurnal, №6. (in Russian)

Kekelia S., Kekelia M., Atasiani G., Gigiadze G., Shavishvili I. (2005) Gold potential of Georgia. Gornyi Zhurnal, №6. (in Russian)

Kvinikadze M., Kekelia S., Sirbiladze V., Kirakosian V., Tumanishvili G. (2005) State of natural environment of Georgia. Gornyi Zhurnal, №6. (in Russian)

Migineishvili R. (2005) Hybrid nature of the Madneuli Cu-Au deposit, Georgia. Geochemistry, mineralogy and petrology, v.43. p.128-132.

Contributed By Ramaz Migineishvili, Chairman of the Georgian IAGOD Group, Geological Institute of Georgian Academy of Sciences, 1/9 M.Alexidze str., 0193 Tbilisi, Georgia. E-mail: ram_migi@yahoo.com
Activities in 2003:
- The interdepartmental council of ore deposits geology was created by the Ukrainian State Geological Service jointly with the Ukrainian National IAGOD group;
- The preparation for organization of an international field workshop on Ukrainian ore deposits in 2005 was initiated;
- The Ukrainian Working Group on precious metal deposits was organized (head is Prof. O. Bobrov);
- The Ukrainian Working Group on rare metal deposits was organized (head is DSc. S. Kryvdik);
- The journal “Geochemistry and Ore Formation” as an journal of the Institute of Geochemistry, Mineralogy and Ore formation and UkrIAGOD was prepared;
- Some publications (articles, monographs etc.) about ore forming processes, geology and structure of the different ore deposits were published;
- Annual edition of the Ukrainian National IAGOD Group Bulletin was organized (in Ukrainian);
- English edition of the monograph “Minerals Deposits of Ukraine” together with IAGOD is planed in 2004.

Conferences during 2003:
Members of the Ukrainian IAGOD National Group took effectively part at the conferences during 2003:
- Special conference of the UN for International Classification of the Ore Resources, Geneva, Oct. 2003 (Kalinin V.I., Malyuk B.I.).
- Chines Scientific-Practical Conference for Gold in Syamen, China, 21-29 Sept. 2003 (Mykhaylov V.A.).
- 4th International Conference “New ideas in the Earth Sciences”, Moscow, 8-16 Apr. 2003 (Mykhaylov V.A., Scherbak D.M.).
- 5th Geophysical Readings of the Name of V.V. Fedynsky, Moscow, 27 Feb. – 1 March 2003 (Sheremet E.M.).
- International Scientific-Practical Conference “The Problems of Ore Deposits and Effective of the Mining Works”, Tashkent, 2003 (Guliy V.N.).
- 21st Russian Seminar “Geochemistry of the Magmatic Rocks”, Apatity, Russia, 3-5 Sept. 2003 (Zagnitko V.M., Kryvdik S.G.).
- Regional Scientific-Practical Conference “Actual Problems of the Geological Branch of “ALROS”, Mymy, Russia, 2003 (Prykhodko V.L.).
- International Scientific-Practical “The Problems of the Exploitation of Ore Regions”, Dnepropetrovsk, Ukraine, 15-20 Sept. 2003 (Galetsky L.S., Dragomiretsky O.V., Yushyn O.O.).
- 2nd International Conference “Geoinfomatics: Theoretical and Practical Aspects”, Kiev, March 2003 (Bobrov O.B., Kulish E.O., Malyuk B.I.).
- International Scientific-Practical Conference “Technogenous Minerals and Deposits”, Donetsk, Ukraine, 7-9 Oct. 2003 (Panov B.S.).
- International Conference of the Name of V.I. Vernadsky, Donetsk, Ukraine, Apr. 2003 (Panov B.S.).
- 4 International Conference “Precious and Rare Metals BRM-2003. Technology and Strategy of Development” Donetsk, Ukraine, 22-26 Sept. 2003 (Galetsky L.S., Panov B.S., Sheremet E.M.).
- International Conference “Region-2003. Strategy of Development”, Kharkov, Ukraine, 22-25 Apr. 2003 (Galetsky L.S., Kulish E.O., Mykhaylov V.A., Voevodin V.M.).
- Scientific Conference “Natural Resources of Volyn. The results of Fundamental Studies in 1993-2003”, Lutsk, Ukraine, 1-3 Jul. 2003 (Shumlyanskyyy V.O., Yatsenko G.M.).
- Scientific-Practical Conference “Situation, Perspectives, and Directions of the Researches of Diamonds in Ukraine” Kiev, 19-22 May 2003 (Glevaskyy E.B., Guliy V.M., Gurskiy D.S., Kalinin V.I., Kozar M.A., Kryvdik S.G., Prykhodko V.L., Yatsenko G.M., Yushyn O.O.).
- Scientific-Practical Conference “Metallogeny and Ore Potential of the Tectono-Magmatic Activation Zones of Precambrian of the Ukrainian Shield”, Kiev, 16-18 Dec. 2003 (Galetsky L.S., Dragomiretsky O.V., Mykhaylov V.A., Scherbak D.M.).

Selected publications of the National Group:

Report of the Ukrainian National IAGOD Group for 2003
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2. Voynovsky A.S. Bochay L.V., Nechaev S.V. et al. Complex metallogenic map of Ukraine. Scale 1:500 000. Kiev: UkrDGRI, 2003. 336 p.

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Some future planned activities of the Ukrainian National IAGOD Group in 2004:

- edition of the Ukrainian National IAGOD Group Bulletin;
- preparation, together with IAGOD, of an English edition of the monograph “Mineral Deposits of Ukraine”;
- preparation of Guidebook to Workshop-2006;
- further work on website of the UkrIAGOD;
- initial preparation for a new lectures course “Economic Geology” in the Kiev National Taras Shevchenko University.

New IAGOD members
Academician Pei Rongfu – Honorary Life Member of IAGOD

Prof. Pei Rongfu graduated and received his Bachelor’s degree from the Geoscience Department of the Qinghua University in 1948, and obtained his Academician title from the Chinese Academy of Engineering in 1999. He was the Director of the Institute of Mineral Deposits, Chinese Academy of Geological Sciences (CAGS), the Chairman of the Commission on Geology of Mineral Deposits, Geological Society of China, and also served as President of the International Association on the Genes of Ore Deposits (IAGOD) from 1992 until 1996. He is currently the President of Chinese National Committee of IAGOD.

Academician Pei Rongfu has taken an active part in the activities of international co-operation, and was the leader of Project IGCP354 “Economic Super Accumulation of Metals in Lithosphere” (1995-2000) and the General coordinator of Project of World Metallogenetic Map of Large and Super Large Mineral Deposits (1:25M) between 2002 and 2006.

Prof. Pei has a long career in geology of mineral deposits and geological exploration for mineral resources. He has many achievements in metallogeny, including 4-dimensional metallogenesis (3D) and the evolution of metallogenetic provinces, based on analysis of the metallogenetic history. He also proposed ore-control mechanisms, with five types and four association styles of magmatic rock emplacement and the metallogenic specialization of characteristic petro-assemblages. He has put forward a ore-forming zoning model for mineralization at the regional, orefield and deposit scale in the light of the studies of ore deposits related to granitoids in the Nanling region. Prof. Pei raised a fresh view of co-magmatic complementary differential mineralization in multi-stage petro-minerogenesis; developed the metallogenetic laws from the coupling of the four hierarchical systems within metallogeny (geological “setting”, ore-controlling “site”, metallogenetic “phase” and ore “deposit”), initiated the concept of mineralization by collision orogeny and lithospheric mantle detachment, and re-divided the granitoids in South China into six rock belts. He further reclassified the metallogenic series specialization of different petro-assemblages in different rock belts, based on his studies of metallogenetic series, and subsequently worked out, from the concept of affiliation Metallogenesis, the derived ore deposit as the guide to tracing the metallogenic path for the prognosis of super-large mineral deposits. He constructed the model of ore control by metallogenetic preferentiality and exceptional metallocotect convergence (field), on the basis of his studies of super-large mineral deposits, and took the lead in carrying out the comparative study of mining geology on mineral exploitation and established reasonable sequence of geological exploration and development theories of solid mineral products, such as the theory of “double control”, and “rational domain” of dividing the stage of exploration as well as the supporting system for the decision-making of investment in geological exploration. In short, Professor Pei has not only made important contributions to the theoretical studies on mineral deposits but
also achieved fruitful results in mineral exploration. He was been invited as a convener of a scientific session by the 32nd IGC and delivered a keynote lecture in the session of “Metallogenic Large and Superlarge deposits”, in which he proposed a new idea of anomalous ore-forming process with super accumulation of metals.

Prof. Pei has successively completed more than 10 mineral exploration and scientific research reports and published over 100 scientific and technical papers. The authorities concerned have repeatedly commended him for his outstanding achievements. He was cited and conferred a banner of merit by the Ministry of Energy and Mineral Resources of the Sudan during his aid service to that country in 1979; he won the Second Prize of the National Scientific and Technological Award of China in 1988 and the First Prize of the Scientific and Technological Award of the Ministry of Geology and Mineral Resources of China in 1990, and Geological Scientific Prize of Li Siguang in 1995.

Prof. Pei has been active in fostering newly emerging scientists. He has served as a tutor for over 14 masters, 7 doctorate and 4 postdoctorate projects.

Prof. Ludwig Baumann was born in 1929 in Aue, Saxony, Germany. He studied mining and geology at the Faculty of Natural Sciences of the Bergakademie Freiberg, Saxony, Germany (1948-1953). From 1953-1957 he worked as scientific assistant at the Department of Economic Geology of the Bergakademie Freiberg (Prof. Dr. O.W. Oelsner). Ludwig Baumann received the Doctor rerum naturalium degree in Economic Geology in 1957.

He became the chief geologist of the head office “Ore Mining” of the mining industry of the former German Democratic Republic, and the chief geologist of the Freiberg Pb-Zn-Ag mining company (1957-1963). Ludwig Baumann finished his habilitation degree in economic geology in 1964 and became in 1966 a full Professor in Economic Geology and Metallogeny and the head of the Department of Economic Geology at the Bergakademie Freiberg. In 1967 Ludwig Baumann was a visiting Professor at the St. Andrews University, U.K.

From 1974-1989 Ludwig Baumann was the editor of the Topical Reports of IAGOD - Problems of Paragenesis. He was member of the Organizing Committees of the International Geological Congress 1968 in Prague and the MAWAM symposium 1974 in Karlovy Vary and Cleremont-Ferrand/Paris.

During 40 years at Bergakademie Freiberg, he was the principal advisor for about 130 diploma projects and 59 theses. During his long career he published over 200 papers, books, and monographs dealing with the metallogeny, geology, mineralogy, and geochemistry of ore deposits as well as ore microsocopy. He became Professor Emeritus in 1994, but, in “retirement”, he continues to publish the results of his research, e.g., in 2000 with the first summary book about all mining districts and ore deposit types of the Erzgebirge
metallogenetic province (Baumann, L., Kuschka, E. and Seifert, Th.: “Lagerstaetten des Erzgebirges”. Enke im Georg Thieme Verlag, Stuttgart, New York. 300 p.).

Prof. Ludwig Baumann has worked for the science community not only as a teacher, researcher or leader of different teams and projects but also as an active member of professional organizations and societies. In recognition of his outstanding career and service to long IAGOD as editor of the Topical Reports of IAGOD Prof. Ludwig Baumann is awarded an Honorary Life Membership in IAGOD.

Thomas Seifert, IAGOD Chief Treasurer
TU Bergakademie Freiberg, Institute of Mineralogy, Brennhausgasse 14, D-09596 Freiberg, Germany
E-mail: thomas.seifert@mineral.tu-freiberg.de

GEOLOGICAL SURVEY OF CANADA

Canadian and World Mineral Deposit Databases Online

Following completion of the World Minerals Geoscience Database Project in 2004, the world geology and mineral deposit databases compiled as part of this project were incorporated into the Geoscience Data Repository (GDR) (http://gdr.nrcan.gc.ca/index_e.php) of the Earth Sciences Sector, Geological Survey of Canada. These databases, along with some other GSC mineral deposit databases, are now accessible online from the GDR Mineral Deposits Databases page (http://gdr.nrcan.gc.ca/minres/data_e.php). The list of databases accessible is as follows:

Canadian Mineral Deposits:
1. Gold Deposits of Canada: Distribution, Geological Parameters and Gold Content
2. V and Ti Occurrences of Canada
3. Canadian Radioactive (Uranium and/or Thorium) Occurrences Database
4. MOLYFILE: an Index-level Computer File of Molybdenum Deposits and Occurrences in Canada

World Mineral Deposits:
1. World Distribution of Ni, Cu, PGE, and Cr Deposits and Camps
2. Gold Deposits of the World: Distribution, Geological Parameters and Gold Content
3. World Distribution of Sediment-hosted, Stratiform Copper Deposits and Occurrences
4. World Distribution of Fe Oxide ± Cu ± Au ± U (IOCG) Deposits
5. World Distribution of Porphyry, Porphyry-Related Skarn, and Bulk-mineable Epithermal Deposits
6. World Distribution of Mississippi Valley Type Zn-Pb Deposits
7. World Distribution of Sedimentary Exhalative (Sedex) Pb-Zn Deposits
IAGOD Council Meeting, 24th August 2004

Present: N. Cook, R. Seltmann, J. Aichler, G. Schneider, M. Rafailovich, Mao Jingwen, E. Hammerbeck, B. Isakhodaev, J. Kutina, T. Seifert, R. Jenchuraeva, J. Pasava (ex-officio SGA); Guests: Y. Safonov, V. Distler, V. Kovalenker, O. Chudaev

1. Call to order, roll call and acceptance of proposed agenda.

The Council Meeting was led by Prof. Nigel Cook. The proposed agenda found approval. A moment of silence paid tribute to IAGOD members who recently passed away (see elsewhere in this IAGOD Newsletter).

2. Adoption of proposed changes to council structure.

Nigel Cook introduced the proposed changes to council structure that is paying tribute to reality. The new position of IAGOD Webmaster (replacing the position of former Associate Secretary General) has the aim to give IAGOD a better exposure. The position of Membership Secretary will be renamed ‘Publications Manager’. Council agreed to renew the post of Honorary Past President and to refill posts of 1st and 2nd VP at Large to give NG a higher weighting and better regional coverage in Russia, Central and East Asia.

3. Presentation of list of nominees to IAGOD Council 2004-2008

It was agreed with present Russian delegates to invite Prof. Nick Bortnikov into the new council as 1st VP. He will replace Prof. Ingo Kigai who himself shall focus on leading the Russian NG IAGOD. The proposed list of nominees prepared by the Nomination Committee (chaired by CJ Stanley and M Stemprok) was unanimously approved for election through the subsequent General Assembly.

4. Report of the outgoing IAGOD Membership Secretary

The outgoing IAGOD Membership Secretary, Dr. Reimar Seltmann, gave an overview of membership development during his three terms of duty (1992-2004). He appreciated the great assistance of Jaroslav Aichler (Webmaster) who created and designed today’s IAGOD website as a modern showcase promoting IAGOD as active and healthy learned society. Moving the updated electronic membership database to IAGOD’s password-protected web portal that is accessible to IAGOD Webmaster, Membership Secretary, Chief Treasurer and Secretary General, helped to make the work with the membership database more efficient with all updates transparent. IAGOD members and others can access there the basic membership information.

The membership database had in the past more than 1100 entries. Clearance of those who did not pay annual dues for more than 4 years (by 2000) led to their removal after a last reminder dues notice. Another Membership Directory is scheduled to be published until 2006 through the new Membership Secretary and Chief Treasurer’s office in Freiberg. Per July 2004, IAGOD membership shrank by about 200 to now 858 members in 61 countries. The large number of missing members (40) due to address changes is alarming. Address changes are a continuous process in a mobile modern science society, but create a problem if members disappear to unknown addresses. Whereas membership in National IAGOD Groups (China, Russia, Ukraine, Kazakhstan) is steadily growing, the number of individual members shrunk to only 352. It is expected that with the now combined office of membership secretary and treasurer these trends can be reversed. Among all members, 470 are organized in now 10 National Groups. These proportional changes highlight the weight of membership in NG’s from new emerging economies like Ukraine, Russia and China. These groups should make in the future IAGOD increasingly their own business, as is reflected already in their proposed representation within the new IAGOD Council. Also from the previously 14 Corporate Members (still in 2003) only 2 have paid their dues so far for 2004 and need dues reminder notices. Mergers in mining industry and changed responsibilities influenced that negative trend. Due to passed away members, the number of Honorary Life Members shrunk from 9 to 6 (July 2004). A general problem of all scientific societies, but specifically of IAGOD, is the increasingly unhealthy age structure. Most members in the
smaller NG (Central Asia, Caucasus, Mongolia) are close to or already within pension age, but also individual membership shows a too small number of scientists in the most creative and productive age group 25-45. IAGOD needs throughout a refresh in student and young scientist membership and the IAGOD council seeks volunteers among experts to support leading IAGOD. Adopting OGR as IAGOD journal (with currently discussed access to members in the future) and IAGOD’s active participation and promotion at international conferences (chairing sessions) and other activities (IGCP, IYPE) seem steps in the right direction.

5. Brief report from the IAGOD Secretary General for the period since the last IAGOD Council meeting, Windhoek 2002

Nigel Cook read his report highlighting the numerous activities of NGs, Coms and WGs, specifically the landmark Interim IAGOD Conference in Vladivostok, regional field conferences in Mongolia (2003, 2005), China (2003), Ukraine (2005/2006) and in Russia. Among the most active groups can be listed the Placer group, CTOD, WGOM. Highlights of IAGOD promotion are Ore Geology Reviews as the societies adopted journal (Chief editor: Nigel Cook) and the IAGOD website (maintained by Jaroslav Aichler). The IAGOD publication series (coordinated by Reimar Seltmann), include monographs, maps and guidebooks that are mainly financed, organized and distributed through CERCAMS at NHM London.

6. Presentation of the outgoing IAGOD Chief Treasurer

Richard Grauch provided a written deposition that found approval. He confirmed his assistance in moving the IAGOD account (to date approx. 10,000 Euro closing balance from collected membership dues and various publication income) from Denver/Colorado to Freiberg/Germany. The presentation found approval.

Travel support to attend IGC Florence had been granted to active IAGOD officers Jan Kutina, Jaroslav Aichler, Nikolai Akinfiev and Ingo Kigai. After long, controversial discussion council approved the request of Ingo Kigai to re-allocate the funds for his attendance at the Interim Conference in Vladivostok instead for attending IGC Florence as was initially requested and granted. Council acknowledges financial difficulties of members to find matching funds but needs to highlight existing IAGOD travel grant policies that only up to 500.- Euro per request can be granted to active individuals. Applications must reach the IAGOD Executive Council (addressed to the Secretary General) at the latest 6 months prior to the meeting sought to be attended with a contribution and must be submitted well before the first registration deadline.

7. Reports of other council members present at the meeting

Prof. Jan Kutina gave a detailed report about the large research and meeting activities of CTOD and its various WG’s, the related IGCP project #354 and resulting latest publications in Schweizerbart’s journal “Global Tectonics and Metallogeny” (GTM) edited by Jan Kutina. Council thanked Jan Kutina for his long-standing great activity. Discussion followed the request of Schweizerbart to keep GTM alive, recommending to invite young and active specialists to the editorial board and to apply strict peer-review for all submitted manuscripts with a turn-around of less than 12-15 months.

8. Nomination, citation and adoption of new Honorary Life Members of IAGOD

Since the beginning of IAGOD and during its 40 years existence until July 2004, ten Honorary Life Members (HLM) have been adopted: J.D. Ridge *, G. Kautsky *, M. Stemprok, J. Kutina, H.-G. Foerster, M. Vanecek, C.B. Sclar *, A. Heyl, and R. Boyle, of which 3 have passed away (*). Nominations for new HLM were made and cited for Prof. Ludwig Baumann (Bergakademie Freiberg, Germany) who was active in IAGOD’s PaC and edited over decades the “Topical Reports of IAGOD” in the Freiberger Forschungshefte publication series. The second nomination came for Prof. Pei Rongfu, Institute of Mineral Resources, CAGS Beijing, China, who was a past president of IAGOD and chief organizer of the Quadrennial IAGOD meeting in Beijing, 1994. Both were approved and relayed to the General Assembly for adoption. It was agreed to encourage the Russian NG IAGOD to prepare a nomination for Prof. DV Rundkvist for nomination and adoption as HLM through the 12th Quadrennial IAGOD Meeting in Moscow, August 2006.

9. Current status of IAGOD Commissions, Working Groups, National Groups
The presentation made by IAGOD Secretary General, Prof. Nigel Cook, highlighted the active role of Com’s, WG’s and NG’s contributing to the success of IAGOD.

10. Progress reports and discussions focussing on future IAGOD projects:

- Interim IAGOD Conference in Vladivostok, September 2004
  Oleg Chudaev (FEGI Vladivostok, representing IAGOD President CM Alex Khanchuk) confirmed that all preparations are on schedule, proceedings and reference guidebook in print. About 200 participants (including 40 foreigners) are expected.

- 12th Quadrennial Symposium, St Petersburg 2006
  No representative attending the council meeting; apologies of Dr Oleg Petrov and Dr Shatov because of other meetings; no specified programme available; Separate meeting agreed to take place later still during the IGC in Florence.

- Future IAGOD field workshops & field trips
  Prof. Natalia Patyk-Kara (Moscow, Russia) informed about the International Conference planned in conjunction with her new IGCP project in 2005.
  Nigel Cook and Reimar Seltmann informed that jointly with the Uzbek NG IAGOD and IGCP 473&486 an IAGOD-sponsored field workshop is planned to take place in Uzbekistan in 2005/2006, in Romania 2004, and in Bulgaria 2005 (both jointly with IGCP-486). The Ukrainian NG IAGOD, again jointly with IGCP-473 & 486, is preparing a field conference in Ukraine. IAGOD will take active part in attending the next IGC in Oslo (2008). Prof. Mao Jingwen proposed to have a meeting in China.

- IAGOD publications (sale statistics and future plans)
  Reimar Seltmann informed on the success of the IAGOD publication series. Investment into new products comes now mainly from company sponsorship generated through CERCAMS. Expenses into translation, editing, printing, publishing and marketing versus generated income break even and since 2004 no sponsorship support was requested from IAGOD. It was agreed to run in the future the book account through CERCAMS under direct NHM auditing, separately from the main IAGOD account that is fed from membership dues income and other sponsorship (UNESCO, revenue of IAGOD meetings).

- Other activities
  Involvement of IAGOD in the International Year of Planet Earth (IYPE) was discussed; recommended that IAGOD is participating and take a leading role jointly with SEG, SGA, IGCP and AGID.

11. Adoption of “Ore Geology Reviews” as society journal.

Nigel Cook as the journal’s Chief Editor appointed from Elsevier gave a brief presentation of activities since adoption of the IAGOD journal. The target of 4 issues annually has been met for the first year and 3 more issues are ready for publication. In total 12 special issues are either in the pipeline or proposed (topics include GEODE, placers, Brazil, S China etc.). There are 96 regular submissions to date and the current rejection rate is at 40%. IAGOD members are encouraged to submit their original research to Ore Geology Reviews. In responsibility of senior authors, native English speakers should have edited the English language prior to submission to OGR editor.

12. IAGOD’s relationship with other societies and initiatives

IAGOD is closely cooperating with SGA. At the SGA-2005 Beijing meeting, IAGOD will run two sponsored sessions and jointly with SEG organize the pre-excursion to Mongolia. At IAGOD-2006 in Russia, both SGA and SEG will receive reciprocal benefits of attendance at membership rate and will run independent session modules and/or excursions. Also with SEG exist close contacts but exchange of information and coordination of activities (preventing overlapping or duplication of activities) between all three societies has potential of improvement. IAGOD initiated jointly with SGA and SEG a joint contribution under IYPE coordinated by IUGS-UNESCO. IAGOD is closely cooperating with IGCP and members contribute to many projects.

13. Any other business

Council expressed thanks to Richard I. Grauch who retired from council after serving as IAGOD Chief Treasurer for more than ten years. Dick helped to transform IAGOD into a modern learned society with lively National Groups, WGs and Coms, playing an active role in research and publication. He facilitated the generation of more than ten corporate members from mining industry sponsoring the activities of IAGOD. Within his ten years being
an executive councillor Dick helped to get IAGOD’s legal and fiscal registration as tax-exempt non-profit society registered in the State of Colorado up-to date. He also initiated council policies for travel grants that helped to promote key activities and to support a larger number of active IAGOD members. The treasury budget balance had triplicated during his tenure and became healthy, at times close to 20,000 USD, thus enabling elevated travel support to active IAGOD members and to focus on ambitious new IAGOD publication projects. The IAGOD Council wishes Dick long years of healthy happy life in his continued research, with his family and his many hobbies. Dick has been proposed by Past President Erik Hammerbeck for the next HLM nomination round (approval at IAGOD-2006).

IAGOD General Assembly, 26th August 2004

All topics prepared for and discussed during the Council Meeting on 24th August 2004 were presented to the General Assembly and found unanimously the approval of the attending IAGOD members. Approval includes:

- Report of the IAGOD Secretary General (Nigel Cook) for the period since the last IAGOD General Assembly (Windhoek, Namibia, July 2002).
- Election of nominated IAGOD Council for the period 2004-2008.
- Reports of Membership Secretary, Chief Treasurer, Publication Manager, Working Groups and Commissions (Thermodynamics, CTOD, WGOM, Placer, WGTT) and National Groups (China, Kyrgyzstan, Kazakhstan).
- Prof. Ludwig Baumann and Prof. Pei Rongfu were adopted as new Honorary Life Members. In the list of HLM they are the 11th and 12th HLM adoption, of which including them and considering sadly those who passed away, IAGOD has currently 8 HLM. Next adoption will be at the 12th Quadrennial IAGOD Symposium in Moscow, August 2006 (nomination of Academician Dmitry V. Rundkvist).
- The General Assembly thanked Nigel Cook (OGR), Jaroslav Aichler (Website), Jan Kutina (GTM) and Reimar Seltmann (IAGOD Publication Series) for their efforts promoting and publicising IAgod.
- The General Assembly approved the involvement and active role of IAGOD contributing to the IYPE jointly with SEG, SGA and other societies dedicated to mineral deposit studies.

Minutes drafted by Reimar Seltmann
Revised and edited by Nigel Cook Florence, August 2004

Reports of the IAGOD WGs and Commissions

The IAGOD-CTOD WG1 ‘Global Tectonics and Metallogeny’

Report on Activities

Special Meeting of the IAGD/CTOD WG1 ‘Global Tectonics and Metallogeny’ at the 32nd International Geological Congress in Florence, Italy, organized jointly with ‘L’Organisation Mondiale de Mineralogie (Prof. Angela Craciun, President. OMM, based in Monaco)

New Frontiers in Mineral Exploration: Magnetic and gravity fields from satellite altitude.

Convenors: Patrick T. Taylor 1, Jan Kutina2 and Rongfu Pei3
1 – NASA Goddard Space Flight Center, Greenbelt, MD, U.S.A.
2 – American University, Washington, D.C. 20016, U.S.A.
3 – Chinese Academy of Geological Sciences, Beijing 100037, P.R.of China

Part 1: Invited papers
1. Patrick T. Taylor (U.S.A.): Comparison of magnetic measurements by satellites: Pogo, Magsat, Orsted, and Champ (with gravity field).
2. Jan Kutina, Patrick T. Taylor (U.S.A.): Changes in the patterns of magnetic anomalies of satellite measurements revealing processes that led to concentration of metals. Examples from the western United States, northern Brazil and East Africa.

3. Sergei V. Cherkasov (Russia): Large and superlarge mineral deposits: what we are up to?

4. J. Kutina (U.S.A.), I. Kh. Khamrabaev, I.P. Sidorova & A.A. Kustarnikova (Uzbekistan): Position of the Muruntau gold deposit in the continental-scale zone of latitudinal fracturing (40°–42° N), and its controls and manifestation in a major ore cluster of the Central Kyzylkum region, Uzbekistan.

5. Rongfu Pai, Yanxiong Mei & Jinwen Li (P.R. of China): Exceptional metallotect convergence with superaccumulation of metals in North China Platform and its adjacent area.

Part 2: Open discussion:

Defining “metallotect-potential zones” * Introduced by Jan Kutina

- The term ‘metallotect’, introduced by P. Laffitte et al., 1965, and P. Routhier, 1969 (reviewed in P. Routhier: Ou sont les métaux pour l’avenir?, Memoire du B.R.G.M., no.105, p.46, 1980) is here used in a simplified way, meaning the combination of structural geological, lithological and geochemical conditions favorable for concentration of metals.

The global magnetic anomaly maps, based on measurements from satellite altitudes, reveal a pattern of latitudinal belts of magnetic highs and lows that extend for as much as thousands of kilometers. These belts, when projected over surface geology, extend across boundaries of different geological units. If such lengthy and deep-seated belts are intersected by transverse structures guiding magmatism and ore-forming fluids towards the Earth’s surface, then ore deposits of different types and different ages can be aligned along the same latitudinal structure, or a transverse structure of another trend revealed by satellite magnetometry.

The knowledge of the structural and other parameters controlling the origin and location of a giant ore deposit can assist in the search for other places favorable for large concentration of metals above the same latitudinal or other deep-seated structure revealed by satellite measurements. We can then speak about a “metallotect-potential zone”.

Examples from different parts of the world should serve as a basis for discussion.

1. Example from the western United States.
2. Example from northern Brazil.
3. Example of giant deposits along a continental-scale structural discontinuity extending through the entire northern China, Kyrgyzstan and Uzbekistan.
4. Intersection of an old latitudinal long-extending structural discontinuity with young fracture zones in northern Burma: a new target for exploration.
5. Can the Voisey’s Bay Ni-Cu-Co deposit, hosted in the pattern of east-west fracture zones in the coastal area of Labrador, Canada, indicate a possible presence of a ‘metallotect-potential zone’ in the Canadian Shield? [Based on a preliminary study by J. Kutina, 1999].

Sad news from the IAGOD/CTOD WG1 ‘Global Tectonics and Metallogeny’

It is with our deepest sorrow that we inform you that the following distinguished members and long-term co-workers have passed away in the year 2004:

Dr. E.S.T. O’Driscoll (Australia)

of West Beach, South Australia, Member of the IAGOD/CTOD WG1 ‘Global Tectonics and Metallogeny’, Associate Editor of the journal ‘Global Tectonics and Metallogeny’, internationally distributed by E. Schweizerbartsche Verlagsbuchhandlung in Stuttgart, Germany.

Tim – as we always called our dear friend, was one of the most active scientists in the studies of deep controls of ore deposits. He introduced a special technique of recognizing “corridors” in the Bouguer gravity anomaly patterns, revealing deep-seated structural discontinuities expressed as lineaments on maps. He demonstrated the role of these discontinuities in guiding the ascent of magmas and ore-forming fluids into the upper crust and their use in defining
targets for mineral exploration. While associated with the Western Mining Corporation, he was on the team of scientists checking his prediction which culminated in the discovery of one of the world largest ore deposits – the Cu-Au-U Olympic Dam at Roxby Downs in South Australia.

The broad spectrum of topics covered by Dr. O’Driscoll will be reviewed in a “Memorial Volume” which is being prepared by our Australian colleagues under chairmanship of Ingrid B. Campbell and co-workers. Information can be received from Dr. C.R. Twidal, Geology & Geophysics, School of Earth and Environmental Sciences, The University of Adelaide, Adelaide 5005, South Australia.

Titles of some papers published in ‘Global Tectonics and Metallogeny’ (GTM):
E.S.T. O’Driscoll: The application of lineament tectonics in the discovery of the Olympic Dam Cu-Au-U deposit at Roxby Downs, South Australia. – GTM, 3 (1): 43-57, 1985.
E.S.T. O’Driscoll & I. B. Campbell: Mineral deposits related to Australian continental ring and rift structures with some terrestrial and planetary analogies. – GTM, 6 (2):83-101, 1997.

• Available for distribution:
The issue of Global Tectonics & Metallogeny, Vol.3, No. 1 of December 1985, with papers on “Parameters Controlling the Distribution of Large Ore Deposits, Ore Clusters, Mineral Belts and Metallogenic Provinces” containing O’Driscoll’s invited paper on the discovery of the Olympic Dam Deposit has been published in greater number of copies to promote cooperation. It is available for free at request from: Dr. Jan Kutina, Laboratory of Global Tectonics and Metallogeny, c/o Dept. of Chemistry, American University, Washington, D.C. 20016, U.S.A., Fax: 202-885-1752. When using e-mail, please use both addresses: <jkutina@american.edu>, <jkutina@usgs.gov>

Professor CHEN Guoda (P.R. of China)

Academician of the Chinese Academy of Sciences, Director of Changsha Institute of Geotectonics, Academia Sinica, Changsha, Hunan, P.R. of China.

Vice-Chairman of the IAGOD Commission on Tectonics of Ore Deposits (CTOD) and Chairman of CTOD WG4 “Tectono-magmatic activization (Diwa)”.

Editor-in-Chief of the journal Geotectonica et Metallogenia, started in 1977, published by Science Press in Beijing, distributed by the Changsha Institute of Geotectonics, Changsha 410013, Hunan.

Member of the Advisory Editorial Council of the journal ‘Global Tectonics and Metallogeny’ internationally distributed by E. Schweizerbartsche Verlagsbuchhandlung in Stuttgart, Germany.

Professor Chen has introduced the concept of “diwa” as the third, postplatform geotectonic element, distinguishing between the (1) geosynclinal regions; (2) platform regions; and (3) diwa (geodepression) regions, the latter also referred to as regions of activation or activization.

Quoting from his abstract from the 26th IGC in Paris: “In the Mesozoic, most parts of the Chinese Platform were under strong tectonomagmatic activation and a stable region was thus transformed into a mobile one. This latter region has been named by the writer the Region of Activation (1956) or Diwa (Geodepression) 1959, being the third geotectonic element of the continental earth’s crust. Its characteristics and metallogenesis have been discussed in details in some previous publications…”

The paper “The Diwa region – a postplatform mobile region of a new type” (Chen, 1965) was referred to in A.D. Shcheglov’s “Metallogeny of the regions of autonomous activation” (Leningrad, publ. by Nedra, 1968, in Russian) as one of the basic papers on activization of platforms.

Prof. Chen’s studies of postplatform activization, followed by many scientists, grew up into a very extensive literature. They are reviewed in the monograph “Diva theory. Activated Tectonics and Metallogeny”, published by the Central South University Press in Changsha, in 2000, with an attached list of several hundreds of publications. The processes of reactivation of platforms have been worldwide recognized, although the term “diwa” is not always used.

Professor Chen deserves sincere congratulation from all of us, with wishes that his graduates and followers will be further developing the work pioneered by his Master.
Selected references
Chen Guoda (1956): Examples of “activated regions” in the Chinese Platform with special reference to the “Cathaysia” Problem. – Acta Geologica Sinica, 36 (3): 239-272
[Quoted after Chen, 1980].
Chen Guoda (1959): The Third Fundamental Geotectonic Element – Diwa (Geodepressions) Region. – Scientia (Kexue Tongbao), Academia Sinica, 1959 (3): 94-95. [In Chinese]. [Quoted after Chen, 1980].
Chen Guoda (1965): Oblast’ Diwa – posleplatformnaya podvizhnaya oblast’ novogo tipa. [Diwa region – a postplatform mobile region of a new type]. – Scientia Sinica, XIV (10): 1478-1498. [In Russian].
Chen Guoda (1978): Methods of Metallotectonic Researches. – Beijing, Geological Press, pp.413 [In Chinese].
Chen Guoda, Editor-in-Chief (1977, 1980): Tectonic Map of China. First and Second Edition. Scale 1: 4,000,000. Changsha Institute of Geotectonics.
Chen Guoda (1980): The Theory of Diwa (Geodepression) and its Practical Significance. – 26th IGC, Paris. Abstract. Preprint, English pp.4, Chinese pp.10.
Chen Guoda (1981): On the Tectonics of China. – Global Tect. and Metall., 1(3): 276-285.
Chen Guoda (1988): Tectonics of China. – International Academic Publishers, A Pergamon-CNPIEC Joint Venture, pp.257.
Chen Guoda (2000): Diwa Theory – Activated Tectonics and Metallogeny. – Central University Press, Changsha, Hunan, China, pp.426.

Jan Kutina, Chairman, IAGOD/CTOD WG1 ‘Global Tectonics and Metallogeny’

Report of the IAGOD Working Group on Tin and Tungsten Deposits (WGTT) for 2003-2005

Main results in 2003-2005:
1) WGTT officers played an active role in organizing and chairing a session on “New developments in tin, tungsten and rare metal deposits” at the IGC 2004 in Florence, Italy, August 2004.

2) WGTT contributed to the Interim IAGOD conference on “Metallogeny of the Pacific Northwest: Tectonics: Magmatism and Metallogeny of Active Continental Margins” in Vladivostok in September 2004, and co-sponsored one of the sessions. WGTT officers assisted as co-conveners of this session.

3) The WGTT continued to cooperate in the preparation of a database on global tin and tungsten deposits, with the support of the World Minerals Geoscience Database Project of the Geological Survey of Canada. This database is being compiled by W.D. Sinclair (Geological Survey of Canada), G.A. Gonevchuk, P.G. Korostelev and B.I. Semenyak (Russian Academy of Sciences, Vladivostok), S. Rodionov (Russian Academy of Sciences, Khabarovsk), R. Seltmann (Natural History Museum, London), M. Stemprok (Charles University, Prague), and Mao Jingwen (Chinese Academy of Geological Sciences). A preliminary map was prepared in 2002 and displayed at the 11th Quadrennial IAGOD Symposium and Geocongress 2002 in Windhoek, Namibia.

Future activities (2006 and beyond):
1) WGTT officers will organize and chair a session on “Sn, W and rare-metal magmatic-hydrothermal systems” at the 12th Quadrennial IAGOD Symposium in Moscow, Russia, 21-24 August 2006.

2) WGTT members will continue to contribute to the compilation of the digital database on global tin and tungsten deposits, with the support of the World Minerals Project of the Geological Survey of Canada. Following completion of the World Minerals in 2004, the world geology and mineral deposit databases were incorporated into the Geoscience Data Repository (GDR) of the Earth Sciences Sector, Geological Survey of Canada. These databases are now accessible online (for more information, see the GDR page at http://gdr.nrcan.gc.ca/minres/data_e.php). The tin-tungsten database is scheduled for completion and online accessibility in 2006.

W. David Sinclair, Chairman WGTT R. Seltmann, Vice-Chairman WGTT
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; geoexpl@eazy.net
Secretary - Doctor of Sciences Natalia G. Patyk-Kara, IGEM RAS, Russia; p.kara@igem.ru

REPORT FOR 2003-2005

Measures performed in 2004:
(1) Participation in the 32nd IGC, Florence with a series of presentations dedicated to placer deposit geology – in Topical and General Symposia T10, G14, G19, etc.
(2) Preparation and organization of the Session “Placer Minerageny of Active Continental Margins” in the frame of the Interim IAGOD Conference on Metallogeny of the Pacific Northwest (Vladivostok, 11-19 September, 2004). Co-conveners: prof. Natalia Patyk-Kara, IGEM RAS, Moscow, Russia, and Dr. Jan Krason, Geoexplorers International Inc, Denver, USA.
(3) 13th International Symposium on Placer and Weathered Rock Deposits (PWR-2005) titled «PLACERS AND WEATHERED ROCK DEPOSITS: FACTS, PROBLEMS AND WAYS TO SOLVE THEM», August 22-26, 2005, Perm’, Russia.
This Symposium was held under the aegis of the Russian Academy of Sciences, Ministry of Natural Resources of the Russian Federation, Ministry of Education and Science of the Russian Federation, and International Association on the Genesis of Ore Deposits (IAGOD). The main local host organizers were the Perm’ State University by support of the Perm’ Territory Administration and other institutions (see report below)
Chairman of the Organizing Committee – academician Nikolay A. Shilo (IGEM RAS), Vice-chairwoman – prof. Natalia G. Patyk-Kara, (IGEM RAS), Scientific Secretary – Dr. Vladimir A. Naumov (Perm’ State University). Ample list of the Organizing Committee will be announced later (the 1st Circular is attached).
(4) Preparation and organization of the Annual Conference “Mineral Deposits of Continental Shelves” (in cooperation with IGCP464 and Scientific Institute “VNIIOkeangeologiya”, May 2005, St.Petersburg. Submarine placer deposits on continental shelves are among the main topics of this conference.

Publications:
Patyk-Kara N.G. and Ivanova A.M., 2003. Geochemical prospecting for mineral deposits on the shelf. Editors: N.P.Laverov and I.S.Gramberg, Moscow: Scientific World. – 416 p.
The monography summarizes long-term experience of geochemical investigations on the continental shelf of Russia and outlines criteria for geochemical prospecting for mineral deposits. The considerable part of the monograph is dedicated to prospecting of buried and submerged placer deposits which are located in offshore zones. Geological-geochemical models for the main economic types of submarine placer deposits are given. The book is intended for marine geologists and prospectors involved in geochemical searching and exploration of mineral deposits.
Natalia Patyk-Kara
Secretary of COPD

13th International Symposium on Placer and Weathered Rock Deposits (PWR-2005)
«Placers and Weathered Rock Deposits: Facts, Problems and Ways to Solve Them»

Russia, Perm’, 22-26 August, 2005

The 13th International Symposium on Placer and Weathered Rock Deposits (PWR-2005), titled “Placers and Weathered Rock Deposits: Facts, Problems and Ways to Solve Them” was held from 22 to 26 August 2005 in Perm’, Russia. The symposium was held under aegis of International Association on the Genesis of Ore Deposits (IAGOD) and was hosted by the Russian Academy of Sciences, the Ministry of Natural Resources of the Russian Federation and the Ministry of Education and Science of the Russian Federation. Perm’ Territory Administration, Russian Foundation for Basic Researches (RFBR), Joint-Stock Companies “Lukoil”, “Sylvinite”, “Uralalmaz
(Uraldiamond)” and “Placer Miner” rendered an additional financial support in field geological trips management. The Perm’ State University was acting as the main host institution.

Fig. 1. All the participants of the 13th International PWR Symposium (PWR-2005) and the IGCP-514 Project meeting in front of the Geological Faculty of the Perm’ State University.

The Conference was attended by nearly 140 participants from Russia, Australia, Canada, China, Ukraine, Belarus, Kirghizia, Republic Uzbekistan (Fig. 1), which represented about 40 institutions and mining companies. In addition, 55 institutions were presented in absentia (by published abstracts).

The history of placer symposia goes back to 1959 with four year periodicity on average; however they have gained the international status since 1997 only (the 11th Symposium, Russia, Dubna). The Urals was chosen as the place of the “Placer and Weathered Rock Deposits Conference” with consideration to the fact, that in spite of its huge mineral potential for placers (gold, diamonds, platinum and rare metal mineral, piezo-quartz, gem stones) and weathered rocks deposits (bauxites, nickel and cobalt), such conferences have never been held here. The attraction of the Perm’ region (which gave the name to the Permian geological period) as the venue of the Symposium was determined also by its modern high economic stability, well-developed potential of mineral resources, and rich and variable landscapes.

The program of the Symposium included four-days business meetings, one-day inter-conference and 2 two-day post-conference field excursions. The Symposium was officially opened by the academician Nikolay Shilo, by the 1st pro-rector of the Perm’ State University professor V. Suslonov and by the representative of the representative of the Perm’ Territory Administration V.Poloshkin.

The plenary session (invited lectures) was given to general and key problems of PWR mineral deposits problems, such as “Placer-forming and placer-bearing formations” (Yu. Shumilov), “Evolution of weathered rock deposits through the Earth history” (A.Savko), “Technogenic placers of the Ukraine” (Yu. Bragin), “Fine-grained placer minerals as sources of raw material” (B.Lunev), etc. The extended presentation of B. Hou “Challenging the myths of the Eucla Basin (South Australia) and archiving the discoveries of beach placers” revealing the technology of new mineral sand placer deposits discovery was most useful for Russian placer geologists who are facing the analogue challenge when searching for fossil marine placers in interland areas.

In total, 42 papers (including invited lectures) and 32 posters were presented during the four days of scientific sessions. The following main topics were dealt with:

1) Placers and weathered rock mineral deposits (PWR) of activated platforms and fold belts;
2) Epochs of placer and crust of weathering formation; their evolution through the Earth’s history. Large and super-large PWR mineral deposits;
3) New technologies of prospecting, exploration, mining and beneficiation, and ecological aspects related to development of PWR mineral deposits;
4) Complex assessment and development of PWR mineral deposits;
5) Artificial recycling mineral deposits: assessment and development.
The inauguration meeting of the ICGC-514 Project “Fluvial palaeo-systems: evolution and mineral deposits” took place in the framework of the symposium too.

The general idea which run all through most of presentations was that the last two decades showed that resources of placer and weathered rocks mineral deposits have not been exhausted yet, and future trends are related both to re-estimation of old well-known mining regions and to new discoveries in new potential regions and provinces. Many papers the need for comprehensive approach when estimating and using of mineral deposits that suits the sustainable development criteria. Most of the symposium PWR-220 contributors took part in the IGCP-514 inauguration meeting.

The object of the one-day inter-conference field excursion was the unique Kungur ice cave, located in 45 km to south-south-east from Perm’. Kungur karst cave is one of the most interesting natural object in the Perm’ district; it is eroded in dolomites of the Upper Permian and is well-known for its ice stalactites and ice dripstones covering walls and ceiling.

Fig. 2. Book jacket of the Abstracts Volume of the 13th PWR Symposium, 2005.

Fig. 3. Geological field excursion on the Krasnovi-shersky diamond placer deposits. PWR-2005 and IGCP-514 participants observe the Lower Devonian diamond-bearing Takata Suite (Ishkov open pit);
The first of the two-day post-conference field trips acquainted participants with diamond placers of the oldest in Russia Vishera diamond-bearing region known from 1829. The region is located on the north of the Perm’ district. Joint-Stock Company “Uralalmaz” was a receiving institution. The main peculiarity of the region which is characterized by extremely high quality of gem diamonds is the absence of their fixed primary sources. The nature of Vishera diamonds is open to question. The most substantiated hypothesis connects origin of rich alluvial diamond placers with some intermediate sedimentary hosts of the Paleozoic age (Kolchinskaya Suite, Lover Silurian, and the Lower Devonian Takata Suite, in which diamonds entered from more ancient, probably the Upper Proterozoic (?) intermediate hosts or directly from primary sources destroyed by now. The mere fact is the low-consolidated sandy-conglomerates of the Takata Suite are a fossil karstic-alluvial diamond-bearing placer producing high-quality gem diamonds (Fig. 2). The 35 carats diamond was found in these deposits in 2004 (Ishkov quarry) (Fig. 3).

Fig. 4 (left). The 35 carat diamond found in the Ishkov open pit in 2000.

Fig. 5 (right). Dredge operating on artificial diamond placer of Rassolnaya River.

Among the Cenozoic commercial diamond-bearing placers the following types are recognized: – Placers of structural depressions and high terraces (of Miocene and Pliocene age), – placers of erosion karst depressions (Miocene-Lower Quaternary), – placers of low alluvial terraces, floodplain and channels (Quaternary), – artificial placers (are mined since 1984). We can but mention another hypothesis on diamond origin of Vishera region which connects them with “tuffisites” similar to Argyle pipe tuffs (Australia); however strong evidences to argue for this idea have not been obtained yet.

Fig. 6. Participants of the 13th PWR Symposium testing the quality of gold extraction by a screw separator.
The second post-conference field excursion goes over the Gornozavodsky region located to the east-north from Perm’ close to the Europe-Asia border. Mineral deposits of the region are known since 1820, when the first gold placers were found and mined by diggers. Today this is a well developed mining region where chromite deposits (including placers of boulder ores), gold, diamond and platinum metals placers are known. Just here the first in Russia diamond was found in 1829. The peaks of gold and platinum placers mining fall on late 19th – early 20th centuries and later on 1960-70 years. By now, resources of gold and platinum placers are exhausted to a great extend, and tailings and artificial placers are objects of foremost mining, at that dumps of platinum placers being re-washed 2-3 times.

In closing ceremony the location of the next (14th) PWR Symposium was discussed. The offer of scientists from the Siberian Branch of RAS to hold the PWR-2009 Symposium in Novosibirsk was approved.

Natalia Patyk-Kara,
Vice-Chairperson of the 13th PWR Symposium,
Co-leader of the IGCP-514 Project,
IGEM RAS, Staromonetny per., 35, 119017 Moscow, RUSSIA

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

Themes under consideration by the working group include:
- Experimental study and thermodynamic description of mineral-fluid equilibria over a wide range of temperature (25-1000°C) and pressure (1 - 10000 bars):
- Experimental investigations of thermodynamic properties of ore elements;
- Properties and specialities of low density fluids;
- Properties and specialities of mixed (H₂O . volatile) fluids;
- Properties and specialities of H₂O near critical region;
- Development of new software for computing equilibria in complex heterogeneous systems;
- Computer modelling of transport and deposition of ore elements under hydrothermal conditions.

From 14th to 16th April 2003 the Sixth International Conference "New Ideas in Earth Sciences" took place within the precincts of the Moscow State Geological Prospecting University, Moscow, Russia. During the section on "Physical Chemistry of Natural Ore Forming Fluids" at this Conference, the full range of the problems mentioned above problems were discussed. The list of selected topics of scientific oral presentations is given below (in alphabetic order).

Akinfiev N.N., Diamond L.W., Krüger Y. Solubility of CO₂ in water and in aqueous NaCl solutions from 0 to 100°C and from 0.1 to 100 MPa: Evaluation of literature data and thermodynamic modelling.
Borisov M.V., Bychkov D.A. Mechanisms of formation of filling veins.
Bychkov A.Yu. Transportation of elements in the gaseous-vapour phase: new experimental data and geochemical sequences.
Grichuk D.V. Fluid boiling as a factor of ore formation of sulphur deposits
Kolonin G.R., Kupriyanova I.I., Shironosova G.P., Sokolov S.V. Specialties of physical chemical behaviour of rare earth elements in the postmagmatic processes.
Ko'lssov A.B. Mechanisms of creation of nonequilibrium in fluid-rock systems and their numerical models.
Kozlovsky V.M. Physical chemical model of vein plagiomigmatites formation
Kurovskaya N.A., Lukarin O.A., Ryzhenko B.N. Zinc and lead speciation in aqueous chloride fluids at the granitoid magmatism conditions.
Kurovskaya N.A., Lukarin O.A., Ryzhenko B.N. Zinc and lead speciation in aqueous chloride fluids at the granitoid magmatism conditions.
Malyshev A.I. Sulphur in the sulphide ore formation
Matveeva S.S., Bychkov A.Yu., Sushchevskaya T.M. Physical chemical mechanisms of cassiterite and tungsten ores formation.
Novoselov A.A., Mironenko M.V., Bazylev B.A., Silant'ev S.A. Phase transformations, balance of substances and redox conditions in the processes of interaction of peridotites of Middle-Oceanic Ridges with seawater.
Prokof'ev V.Yu., Akinfiev N.N. Peretyazhko I.S., Tagirov B.R., Voronin M.V. Role of boric acid in the hydrothermal ore formation.
Strel'tsova N.I. Paragenesis of sulphides and oxides of iron, copper and zinc in the Cu-Fe-Zn-S-O2-H2O system.
Tkachenko S.Yu., Taletskaya C.Yu., Bychkov A.Yu. Solubility of cuprite and tenorite in the low density aqueous fluids.
Voronin M.V., Akinfiev N.N., Zotov A.V. Solubility of AgCl(cr.) in the AgCl-NaCl-H3BO3- H2O system at 150-300ºC.

Recent publications of the members of our working group:

Books:
Prokof'ev V.Yu., Peretyazhko I.S., Smirnov S.Z., Tagirov B.R., Groznova E.O., Samsonova E.A. (2003) Boron and boric acids in the endogenous ore forming fluids. Moscow, Pas'va Press, 192 pp. (in Russian).
Yurgenson G.A. (2003) Typomorphism and ore formation. Novosibirsk: «Nauka», 368 pp. (in Russian).

Papers:
Akinfiev N.N., Diamond L.W. (2003) Thermodynamic description of aqueous nonelectrolytes at infinite dilution over a wide range of state parameters. Geochemistry et Cosmochimica Acta 67, 613-627.
Borisov M.V. (2003) Geochemical and thermodynamic models for the genesis of low- and medium-temperature vein mineralization and metasomatism in the wall rocks. Geochemistry International 41 (suppl. 2), 145-312.
Borisov M.V., Bychkov D.A., Shvarov Yu.V. (2002) Thermodynamic simulation of the genesis of filling veins. Geochemistry International 40 (suppl. 1), 92-102.
Diamond L.W., Akinfiev N.N. (2003) Solubility of CO2 in water from -1.5 to 100°C and from 0.1 to 100 MPa: evaluation of literature data and thermodynamic modelling. Fluid Phase Equilibria 208, 265-290.
Karpov I.K., Chudnenko K.V. (2002) The Geothermobarometry Problem under Unsteady Equilibrium Conditions as the Inverse Problem of Convex Programming. Doklady Earth Sciences 385 A, 661-664 (in Russian).
Karpov I.K., Chudnenko K.V., Kulik D.A., Bychinskii V.A. (2002) The convex programming minimization of five thermodynamic potentials other than Gibbs energy in geochemical modeling. Am. J. Science 302, 281-311.
Rappo O.A., Tagirov B.R., Osadchii E.G. (2003) Determination of standard thermodynamic properties of ternary sulphides in the Ag-Au-S system by solid-state galvanic cell technique. Electronic Scientific Information Journal “Herald of the Department of Earth Sciences RAS”, N 1 (21), 1-3.
Zotov A.V., Shikina N.D., Akinfiev N.N. (2003) Thermodynamic properties of the Sb(III) hydroxide complex Sb(OH)3(aq) at hydrothermal conditions. Geochimica et Cosmochimica Acta 67, 1821–1836.

Contributed by Prof. Nikolay Akinfiev

...continued...

IGCP Project #473

“Metallogeny of Central Asia: a GIS-based synthesis on a modern geodynamic background”

Project rationale and background

A follow-up project to IGCP-373 (“Ore-bearing granites of Eurasia”, 1997-2002) has been submitted to the IGCP Board in Fall 2001 under the new IGCP’s Young Scientist Project scheme and funding was approved in begin February 2002 to run the research as a normal IGCP project (# 473) for five years (2002-2006). The accepted co-operation project is focused on the geodynamics and GIS metallogeny of the Uralides-Altaids orogenic collage.
IGCP-473 is a merging project within a larger research network. The research is co-ordinated through Dr Reimar Seltmann (project leader) from the Center for Russian and Central Asian Mineral Studies (CERCAMS) that hosts CERCAMS at the Mineralogy Department, NHM London. The project benefits from an accompanying training component for young scientists in the frame of EU-funded and national grant schemes (pending applications). The project (experts from 30 countries indicated collaboration interest) brings together geoscientists of different specialization, GIS experts, and young postdoctoral and postgraduate researchers from Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan, China, Mongolia and Russia, who use the chance to cooperate with researchers from other parts of the world.

CERCAMS hosts experts and young scientists from the former Soviet Union for short-term visits in the frame of the project research, provides training and lab access, to work on GIS datasets and metallogenic-geodynamic maps that are of interest also to the mining industry and government agencies. CERCAMS contributes a sum equal to the annual IGCP grant allocation by waiving any overheads (covering bench fees, providing free lab access). CERCAMS sponsored already the new office equipment for visiting scientists. Leading senior researchers and expert teams in the research field are invited to contribute to the cooperation network and GIS products and are invited to attend joint project meetings.

The project management structure has been defined (appointment of co-leaders, establishing network structure and meeting schedule). The approved IGCP-473 co-leaders are: O. Fedorenko (Kazakhstan, coordination of Central Asian research and representing simultaneously network partners from Kyrgyzstan, Uzbekistan and Tajikistan); Mao Jingwen (China), and V. Shatov (Russia).

Summary

The Central Asian region, occupying the territories of Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan and adjacent areas of the Russian Federation ? countries with a transition economy (Target Countries), hosts over 2500 mineral deposits of variable size, age and type (Au, Cu, Pb-Zn, U, Mo-W, Cr and Sb-Hg deposits). The mineral potential of this region is tremendous, however, the present-day metal production, coming largely from state-owned enterprises, has declined sharply in the past decade. It is a vital need for the Central Asian countries to develop their mineral resource base in order to solve their current transition economy problems (need of know-how, investment, sustainable use of raw material base) and this project will be a contribution to that. Large areas of Central Asia have had traditional Soviet-style prospecting, but relatively insignificant modern exploration by advanced technologies. The territory of Central Asia has been thoroughly studied during the last 50 years. Although these studies were successful in recognition of more than 250 metallogenic zones and ore fields of different ore composition and age of mineralization, an understanding of the factors, which control the distribution of major ore deposits remains equivocal. Earlier metallogenic studies were based on largely dogmatic views, assuming that the crustal evolution of Central Asia was essentially static. In addition, many deposits were typified according to standards, which significantly differ from the internationally accepted classifications of exploration models. There is a serious scientific gap between existing old-style knowledge of the Central Asian metallogeny and modern-style understanding of its geodynamic evolution.

This study will help to overcome these problems as the proposed geodynamic analysis will take into account metallogenic constraints. Until present time there were no studies of the metallogenic evolution of Central Asia and adjacent areas on the basis of the plate tectonic approach. Despite many attempts, there are no geodynamic and metallogenic maps of Central Asia and adjacent areas available yet that are of suitable quality to satisfy international standards, because the existing maps cover either only selected orogens or selected republics of Central Asia and are not accompanied by GIS-oriented thematic databases. The main goal of the proposed research will be achieved through the correlation of the stages of crustal evolution, magmatism and ore formation across the national borders. The proposed study will integrate the currently available data, including results obtained during the previous INTAS-93-1783 and IGCP-373 projects, new data in order to combine the geotectonic units of Central Asia and its mineral inventory, and to see the metallogenic evolution against the background of crustal growth during accretionary orogeny aiming to develop a unified metallogenic-geodynamic model of Central Asia. The selected mineral deposit sites will be studied in the field and by modern laboratory methods to obtain data on geochemistry of ores, mineralized
rocks, wallrock alteration, and country rocks for developing genetic models of major mineral deposits in accordance with the best international practice.

This complex interdisciplinary research through the complementary teams will result in the compilation of a set of GIS-based geological, geodynamic and metallogenic maps of Central Asian countries at a scale of 1:1,500,000 aiming to assess the mineral potential of the study area. It is expected that the final maps and databases will be available in a single GIS-based package and might help in recognition of prospective exploration terrains and mineral assessment of Central Asia.

http://www.nhm.ac.uk/mineralogy/cercams/IGCP-473.html

http://www.nhm.ac.uk/research-curation/projects/cercams/index.html

Dr. Reimar Seltmann
Centre for Russian and Central EurAsian Mineral Studies (CERCAMS),
Department of Mineralogy, Natural History Museum, Cromwell Road, SW7 5BD,
London, United Kingdom. Tel.: +44 207 942 5042, Fax: +44 207 942 6012, e-mail: R.Seltmann@nhm.ac.uk

Annual Report of IGCP Project No. 473 (2005)

Summary of major past achievements of the project (2002-2004)

During 2002 the project framework has been set up after successful negotiation of the involvement of the Central Asian partners, including access to unpublished local and Russian language reports, maps and data sets. Official government support has been secured from Kazakhstan, Kyrgyzstan and Uzbekistan as well as Russia, Mongolia and China to cover the involved countries' research contribution and their assistance to contribute to labor expenses and meeting travel. The new geological base map of Central Asia has been completed (scale 1.5M, vector format, Corel Draw) and geophysical and topographic layers have been added (vector format). The GIS database has been structured and distributed to the virtually connected project teams. Research on mineral potential, prospective metallogenic belts and unconventional deposit types has led to the identification of key problems where studies focused from Year 2 onwards. The study integrated available data with new data in order to combine the geotectonic units of Central Asia and its mineral inventory. The approach permits to see the metallogenic evolution against the background of crustal growth during accretionary orogeny and aims to develop a unified metallogenic–geodynamic model of Central Asia. Selected mineral deposit sites were studied by local partners and jointly with foreign visitors in the field and by modern laboratory methods. To obtain data on geochemistry of ores, mineralized rocks, wall-rock alteration, and country rocks for each deposit type case study objects were selected (Muruntau, Kumtor, Verkhnee Kairakty, Jubilejnoe, Kalmakyr, Jeroy, Dzhezkazkan etc.). The case studies aim to develop genetic models of the major mineral deposits. Interdisciplinary research included the classification and databasing with processing of about 1700 deposits within the hosting terrains according to their age, deposits type, and metatelluric. The complex research and correlation has been carried out through complementary teams with technical-methodological skills in GIS techniques and geodynamic-metallogenic expertise. This resulted in the compilation of a set of GIS based geological, geodynamic and metallogenic maps of Central Asia, scale of 1:1,500,000 aiming to assess the mineral potential of the study area.

In 2003-2004 (Years 2-3) the basic components of an ArcInfo GIS package on the Mineral Deposits of Central Asia have been assembled. A data model has been developed through the project team, the template of the database was structured and overhanded for further input to local experts. Thematic map layers were digitized and linked with the deposits database. For the first time a topography layer for that region got linked with a new developed modern geology map for which the project holds copyright, further combined with mineral deposits layer, gravity and magnetic layers. That formed the prerequisite for the queriability of hotlinks and feasibility to carry out spatial analysis, both characterizing modern GIS tools requested by end-users. Assessment and processing of satellite imagery (Spanish and US team) is ongoing. The imagery used as data source is the MODIS sensor, based on the satellite Terra. Alternatively, jointly with the Kazakh team SRTM satellite imagery was processed for selected districts (Balkhash-Dzhungar, Central Kazakhstan). The project leader obtained official approval from the Mongolian, Russian, Chinese, Uzbekistan, Kazakhstan, Tajikistan and Kyrgyzstan authorities to involve national experts within the project research under the
IGCP. The project further developed cooperation with Russian, Mongolian and Chinese teams who have also proposed to extend the GIS metallogeny study to their neighboring regions of Central Asia.

Beside the Central Asia study region, companion GIS packages were developed (in ArcView and MapInfo with linked ACCESS database) in 1M scale across the borders for the neighboring Urals (Russia), Mongolia, Afghanistan and Xinjiang/China. Those will allow in the future geodynamic and metallogenic synthesis across the borders of Central Asia.

In addition to the Central Asia GIS platform as main project deliverable, available on CD-ROM in ArcInfo (ArcView 3.2) and MapInfo formats including MS Access database linked with thematic layered vector maps, the case studies have lead within the past 4 years separately to more than 200 original publications (incl. 40 original papers in peer-reviewed journals, annual reference guidebooks and peer-reviewed monographs). In 2002-2004, more than 50 expert and training visits from the study region took place to European research facilities, 50% by postgraduates and postdoctoral fellows.

Achievements of the project in 2005

3.1. List of countries involved in the project (*indicate countries active this year)

Communication and meeting attendance linked the project research with scientists from more than 30 countries (of which about 20 were contributing papers to the three project meeting activities in 2005; 25% young scientists <35 yrs). The actual IGCP-473 research is done by 18 core teams mainly CIS-FSU (Central Eurasia), Europe and North America. Ukraine and Belarus teams joined as new country participants. Participating countries are: *Kazakhstan, *Kyrgyzstan, *Uzbekistan, *Tajikistan, *Mongolia, *China, *Russia, *Ukraine, *Afghanistan, *United Kingdom, *USA, *Canada, *Germany, *Spain, *Finland, *Sweden, *Switzerland, *Australia, *France, *Norway, *Austria, *South Africa, *Belarus, *Iran, Netherlands, Italy, Israel, Slovakia, Czech Republic, Portugal, Turkey, Saudi Arabia, India, Japan, Thailand, Bulgaria

3.2. General scientific achievements (including societal benefits)

The project research made progress fully according to the scheduled work program. In March 2004 the GIS package “Mineral Deposits Database and Thematic Maps of Central Asia, Scale 1.5 Million” was officially released (Beta version); an update and upgrade has been launched in Spring 2005 that reflected the user feedback. For Central Asia it is the first ever public available GIS tool combining thematic maps and modern mineral deposits data sets across the borders. The module allows to extend the approach into the adjacent regions of Afghanistan, Xinjiang (China), Urals and Altay where the team has developed simultaneously adequate modules. Those will be synthesized in the next stage, provision to funds availability. As requested from the sponsoring mining companies the GIS package was prepared in two formats, ArcView and MapInfo. The work involved directly 30 scientists from 12 countries but benefits from the compilation, assessment and selection of invaluable materials from public accessible sources, representing the collected expertise of hundreds of Soviet and CIS geologists of several generations. The materials are now under assessment through local government agencies in Central Asia and mining companies. Their feedback will be used to prepare in the iterative process of revision and updating an upgraded version with additional components for release by 2006.

On the occasion of the 32nd IGC (Florence, August 2004) was released the English version of the “Atlas of Mineral Deposit Models of the Republic of Kazakhstan”, a joint publication of the Kazakhstan government and NHM London (CERCAMS) under the auspices of IGCP-473. Compilation of similar novel book projects on Kyrgyzstan and Uzbekistan is ongoing. These compilations summarize research on major deposit types of Central Asia during the previous decades. The Atlas series may form a supplement to the Mineral Deposits GIS (as PDF hotlink) in the future with the provision of detailed fact files.

3.3. List of meetings with approximate attendance and number of countries

1) **Beijing, China, 18-21 August 2005**: IGCP-473 Session “Paleozoic Geodynamics and Metallogeny of the Altai” at the 8th Biennial SGA meeting and IGCP-473 business meeting. The meeting gathered government representatives of national geological surveys and 50 regional experts in GIS metallogeny of
Central Asia coming from 18 countries. Special focus was on Cu, Au, PGE and base metals and aimed to advance knowledge on exploration targets, to develop predictive deposit models, to facilitate GIS based deposit case studies with invited local experts, to incorporate their knowledge and to update the mineral deposits database accordingly. A peer-reviewed Proceedings Volume has been published (Springer Publ.) including the 21 papers presented for the IGCP-473 session edited by R Seltmann as session convener.

2) Ulaan-Baatar, Mongolia, 13-17 August 2005: IGCP-473 field trip “Geodynamics and Metallogeny of Mongolia” (Excursion Guides: R Seltmann/IGCP-473 leader, DJ Kirwin/ Ivanhoe Mines Mongolia; Ochir Gerel/Mongolian University of Science & Technology). The field trip followed a transect from the South Gobi with charter flight to the giant Oyu Tolgoi Cu-Au porphyry to the north visiting the famous Erdenet Cu-Mo porphyry deposit and the producing Boroo orogenic gold mine. The trip was fully booked (25 participants).

3) London, UK, 27-28 October 2005: IGCP-473/CERCAMS-6 workshop on “Mineral Deposits of the Urals”. A new GIS platform will be launched including the whole Urals from the Polar region across the border into Kazakhstan. It will include database with detailed description of more than 15,000 mineral deposits linked with thematic maps in 1M scale. It is a cooperation project with USGS-coordinated Global Mineral Deposits Program and international mining industry who contributed to the costs for this project development (jointly with Russian Ministry of Natural Resources). At the meeting are expected more than 100 pre-registered participants from 10 countries. A CD-ROM with workshop presentations will be published, as well as two Special Issues, one in Ore Geology Reviews (Elsevier) and one in Mineralium Deposita (Springer).

3.4. Educational, training or capacity building activities

The IGCP-473 research network continued its contribution to development, training, and know-how exchange mainly through the CERCAMS host program. That includes grant-in aid support for education and lab training fellowships of young scientists (50% were female) from low developed countries (Stan’s), know-how transfer via joint project cooperation, providing hard- and software to facilitate the research project by using a joint platform, developing e-learning modules (training in GIS techniques at NHM London and VSEGEI St Petersburg; short courses and expert excursions through Clausthal University in mineral deposit types, predictive exploration models, alteration studies etc.). In 2005 again several PhD students (of Central Asian origin or doing research in Central Asia) have completed successfully their PhD research on deposit case studies related to IGCP-473 and have defended the PhD exams (Plotinskaya, Russia; Dolgopolova, Kazakhstan; Bekhmukametova/Kazakhstan; Aitmatova/Kyrgyzstan). They had received since 2002 extended research and training fellowships, where hosted at NHM, Clausthal University and other sites in EU, and were supervised in the frame of the IGCP project.

In April 2004 a joint GMRAP/IGCP-473 training workshop on the assessment of Cu-Ni-PGE deposits took place in Almaty, Kazakhstan; in April 2005 the giant sedimentary Cu deposits at Dzhezkazgan were visited. The IGCP-473 involvement and supervision of two former Kazakh PhD students led into joint collaboration with the new Kazakh-British Technical University Almaty (Kazakhstan) where EU-standard education practices and training modules are developed to be delivered (visiting lecture scheme).

For the future, after completion of IGCP-473, is planned to set up an official training site (via funds from EU, NATO, etc.) that shall continue and further develop what IGCP-473 and CERCAMS have initiated. The proportion of postgraduate & postdoctoral students (young scientists <35 yrs) lies about 25%. Higher IGCP support for meeting travel could increase that level.

IGCP-473 contributes to the International Year of Planet Earth (IYPE). Jointly with IAGOD, SGA, SEG, including other IGCP (486, 502), IUGS-UNESCO Mineral Resource Sustainability Program (MRSP, the former DMP), AGID, and IAVCEI (IUGG) work commenced on a DVD “Promoting responsible mineral resource management on planet Earth”. An application has been put forward to the ICSU grants programme.

3.5. Participation of scientists from developing countries

Approximately 50% of project participants come from the 4 Central Asian countries (Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan). If adding China, Mongolia and Russia as emerging transition economy
countries, then 90% of project participants are within that category. The other participants are a minority of leading western experts interested in cooperation with the Central Asian study region, facilitating IGCP-473 (CERCAMS) as umbrella or vehicle to coordinate the research network.

3.6. List of most important publications 2004-2005 (selection including maps)

- Chiaradia, M., Konopelko, D., Seltmann, R. and Cliff, R., 2005 - Lead sources in ore deposits and magmatic rocks of the Tien Shan and Chinese Altay; in Mao, J.W., et al., (Eds.), Mineral Deposit Research: Meeting the Global Challenge, Proceedings of the Eighth Biennial SGA Meeting, Beijing, China, 18-21 August, 2005; Springer, pp. 1301-1304.
- Dalimov, T.N., Ganiev, I.N. and Ishbaev, Kh.D., 2003 - The Chatkal-Kurama "hot spot" and history of magmatic evolution.- Geolobiya i Mineral'nyie Resursy (Geology and Mineral Resources), Tashkent, v. 5 (5), pp. 3-14 (in Russian).

- Dolgopolova, A.; Seltmann, R.; Kober, B.; Weiss, D.; Stanley, C.; Dulski, P. 2004. Geochemical characteristics and lead isotope systematics of highly fractionated Li-F-enriched amazonite granites and related host rocks of the Orlovka-Spokoinoe mining district, Eastern Transbaikalia (Russia). Applied Earth Sciences (Trans. Inst. Min. Metall. B), March 2004, 113, pp. B83-99.
- Gerel, O. and Munkhtsengel, B., 2005 - Erdenetiin Ovoo Porphyry Copper-Molybdenum Deposit in Northern Mongolia; in Porter, T.M. (Ed.), Super Porphyry Copper & Gold Deposits: A Global Perspective; PGC Publishing, Adelaide, v. 2, pp. 525-543.
- Golovanov, I.M., Seltmann, R. and Kremenetsky, A.A., 2005 - The Porphyry Cu-Au/Mo Deposits of Central Eurasia: 2. The Almalyk (Kal'makyr-Dalnee) and Saukulak Cu-Au Porphyry Systems, Uzbekistan; in Porter, T.M. (Ed.), Super Porphyry Copper & Gold Deposits: A Global Perspective; PGC Publishing, Adelaide, v. 2, pp. 513-523.
- Halls, C.; Seltmann, R.; Dolgopolova, A. 2004. Atlas of mineral deposit models of the Republic of Kazakhstan. English edited version of compilation by Kh. A. Bespaev, L.A. Miroshnichenko (Eds. 2004). Almaty, Kazakhstan, 142 pp.
- Herrington, R.J., Puchkov, V.N. and Yakubchuk, A.S., 2005 - A reassessment of the tectonic zonation of the Uralides: implications for metallogeny; in McDonald, I., Boyce, A.J., Butler, I.B., Herrington, R.J. and Polya, D.A., (Eds.), Mineral Deposits and Earth Evolution. Geological Society, London, Special Publications, v. 248. pp. 153-166.
- Jenchuraeva, R.D., Nikonorov, V.V. and Karaev, Yu.V., 2005 - Atlas of Economic Types of Ore Deposits in Kyrgyzstan; State Agency on Geology and Mineral Resources under the Government of the Kyrgyz Republic and Institute of Geology, National Academy of Sciences, Kyrgyz Republic, Bishkek. English edition by CERCAMS, NHM London (in press).
- Kempe, U.; Seltmann, R.; Graupner, T.; Wall, V.J.; Matukov, D.; Sergeev, S. 2004. SHRIMP U-Pb zircon dating of Hercynian granite magmatism in the Muruntau gold district (Uzbekistan). In: Kanchuk et al. (eds, 2004) Tectonics, Magmatism and Metallogeny. Proceed. Interim IAGOD Symp. Vladivostok, Dalnauka, pp. 210-213.
- Kanchuk, A.I.; Govenchuk, G.A.; Seltmann, R., eds, 2004. Metallogeny of the Pacific Northwest (Russian Far East): Tectonics, Magmatism and Metallogeny of Active Continental Margins. Guidebook for the Field Excursions in the Far East of Russia: September 1-20, 2004. Published by Dalnauka Publishing House, IAGOD Guidebook series 11, Vladivostok, 2004, 176 p., 122 figs., 29 tables. (ISBN 5-8044-0464-4).
- Kanchuk, A.I.; Govenchuk, G.A.; Mitrokhin, A.N.; Simanenko, L.F.; Cook, N.J.; Seltmann, R., eds, 2004. Tectonics, Magmatism and Metallogeny. Proceedings of the Interim IAGOD Conference, Vladivostok, Russia; 1-20 September 2004. Vladivostok, DALNAUKA: 2004, 719 p. (ISBN 5-8044-0470-9).
- Kirwin, D.J., Forster, C.N., Kavalieris, I., Crane, D., Orssich, C., Panther, C., Garamjav, D., Munkhbat, T.O. and Niislelkhuu, G., 2005 - The Oyu Tolgoi Copper-Gold Porphyry Deposits, South Gobi, Mongolia; in Seltmann, R., Gerel, O. and Kirwin, D.J., (Eds.), Geodynamics and Metallogeny of Mongolia with a Special Emphasis on Copper and Gold Deposits: SEG-IAGOD Field Trip, 14-16 August 2005, 8th Biennial SGA Meeting. IAGOD Guidebook Series 11: CERCAMS/NHM, London. pp. 155-168.
- Kirwin, D.J., Wilson, C.C., Turmagnai, D. and Wolfe, R., 2005a - Exploration History, Geology, and Mineralisation of the Kharmagtai Gold-Copper Porphyry District, South Gobi Region, Mongolia; in, Seltmann, R., Gerel, O. and Kirwin, D.J., (Eds.), Geodynamics and Metallogeny of Mongolia with a Special Emphasis on Copper and Gold Deposits: SEG-IAGOD Field Trip, 14-16 August 2005, 8th Biennial SGA Meeting. IAGOD Guidebook Series 11: CERCAMS/NHM, London. pp. 175-191.
- Mao, J.W.; Konopelko, D.; Seltmann, R.; Lehmann, B.; Chen, W.; Wang, Y.; Eklund, O.; Usualiev, T. 2004. Post-collisional age of the Kumtor gold deposit and timing of Hercynian events in the Tien Shan, Kyrgyzstan. Econ. Geol. 99, 8, pp. 1-10.
- Mao Jingwen, Frank Bierlein, et al. (Eds., 2005): Mineral Deposit Research: Meeting the Global Challenge. Proceedings of the Eighth Biennial SGA Meeting, Beijing, China, 18-21 Aug. 2005. Springer, Vol. 1-2: 1613 pp. (incl. IGCP-473/IAGOD Session 12 on “Geodynamics and Metallogeny of the Altaiid Orogen” with 21 peer-reviewed papers).
3.7. Activities involving other IGCP projects or the IUGS

The IGCP-473 project with its focus on regional metallogeny of Central Eurasia has close cooperation on Central Asian mineral deposits with the IGCP-486 "Au-Ag-Telluride-Selenide Deposits" that itself has a global thematic focus on those deposits. In April 2006 a joint field conference will be held in Tashkent, Uzbekistan to synthesize jointly the complementary studies in Central Asia. Both projects carry out jointly with teams from IGEM RAS Moscow, IMR Tashkent and Uzbek Academy of Sciences a collaborative case study in the Chatkal-Kurama region (Uzbekistan), hosting important Cu-Au-Ag-Se-Te mineralization and deposits of porphyry, epithermal and mesothermal style (Almalyk-Kalmakyr, Kochbulak, etc.).

IGCP-473 is in contact with the new IGCP-502 “Global comparison of VHMS Districts” and collaborates in Central Asia to mutual benefits, specifically contributing research and datasets on Central Asian volcanic-hosted massif sulfide deposits.

IGCP-473 has involved scientists from IGCP-479 “Sustainable Use of Platinum Group Elements” who contributed to the Annual Workshop of IGCP-473 (NHM London, 4-5 Nov. 2004) on “Ni-PGE Deposits of Eurasia”. Among others, many IGCP-479 researchers from Canada, Italy, France, Russia and Finland attended that meeting.

IGCP-473 collaborates with the newly approved project IGCP-480 on “Tectonics of Central Asia”.

http://www.unesco.org/science/earth/igcp/projects_new.html#480

Structural and tectonic correlation across the Central Asia orogenic collage is a prime focus of IGCP-473 since its beginning (2002), also meanwhile reflected in released key publications dedicated to IGCP-473 (Yakubchuk 2002-2005, Xiao 2002-2004).

IGCP-473 has commenced in 2003 for the first time ever a modern GIS-based terrane synthesis across the state borders in scale 1 Million including Central Asia, Southern Urals, Altay (Mongolia, Kazakhstan,
Russia, China) and Tienshan from Uzbekistan to Xinjiang (China). With Profs. B. Windley and A. Kroener who recently joined the IGCP-473 research to strengthen tectonic and geochronological studies on two crustal transects in Mongolia and across Central Asia, a tectonic synthesis of the Central Asian segments of the Altaids and related correlation is under way. Ongoing IGCP-473 research will link petrochemistry of magmatic arcs, modern geochronology (Re-Os, U-Pb SHRIMP, Ar-Ar, AFTA) and tectonic reconstructions. Mining industry committed to co-sponsor the geotraverse research in Mongolia and Central Asia.

4. Activities planned

4.1. General goals

The GIS package “Mineral Deposits of Central Asia” has been made officially available at begin 2004 (Beta release), with a first update and upgrade in Spring 2005. After circulation to the project team, the vast database, maps and Explanatory Notes (deposit tabulations) will be corrected and updated. Selected authorities from Central Asia (ministers, state secretaries, directors of geological surveys etc.) have been invited to endorse the GIS package to the scientific community by forming an Advisory Board for the explanatory notes. During 2005 the local and regional expertise of Central Asian specialists and feedback from mining companies and other users has lead to an advanced and updated product. Annual updates resulting from the IGCP-473 project cooperation have followed. A focus for 2006 will remain the synchronization of geodynamic evolution, magmatic and metallogenic belts of Central Asia with those of the neighbored regions (Xinjiang, Mongolia, Russia). Matching IGCP travel funds for the IGCP-473 network will be required to facilitate the approach. It is planned that in 2006 the final version of maps and databases will be available in a single GIS-based package for the public domain and will help in recognition of prospective exploration terrains and mineral assessment of Central Asia.

For release in 2006/2007 (OET) a final project monograph on “GEOLOGY OF CENTRAL ASIAN MINERAL DEPOSIT TYPES” is under preparation.

To achieve that the following two supplementary publications are under preparation (in continuation and similar to the Atlas of Kazakhstan Mineral Deposit Models, 2004):
* Atlas of mineral deposit types of Kyrgyzstan (2005), in print;
* Atlas of mineral deposit types of Uzbekistan (2006), in prep.;
* Atlas of mineral deposit types of China (2007), concept under discussion.

4.2. Specific meetings and field trips (please indicate participation from developing countries)

IGCP-473 field campaigns & business meetings to study specific deposit types and to test deposit models in key ore districts of Kazakhstan, Uzbekistan (2), and Mongolia (these are expected to be mainly funded by mining industry and local governments):

20-30 April 2006 – Joint IGCP-473/486 International Workshop in Tashkent, Uzbekistan, with field excursion to deposits of the Chatkal-Kurama region Cu-Au-Ag deposits to study criteria for assessing mesothermal to epithermal formation levels;

10-20 August 2006 – Field conference in Ukraine jointly with IGCP-486 (10 days)

21-24 August 2006 - IGCP-473 session at the Quadrennial IAGOD Symposium in Moscow. This session will be the academic key meeting of IGCP-473 in 2005.

Others (field campaigns jointly with CERCAMS):
* June 2006: Petrochemistry-geochronology transect from Balkhash-Dzunghar (Central Kazakhstan) to Tienshan (Kyrgyz/Chinese border). Sampling campaign for terrane reconstruction, age dating by AFTA, Ar-Ar, U-Pb SHRIMP and examining current geodynamic models to close gaps.
May 2006: Geotraverse across the Central Asian Orogenic Belt to examine and correlate copper and gold deposits of Mongolia with those in the Tienshan - from Oyu Tolgoi Cu-Au porphyry, via Boroo orogenic lode gold, to Erdenet Cu-Mo porphyry deposit;

September 2006: Geotraverse of porphyry-epithermal deposits from Kalmakyr to Kochbulak (Uzbekistan) and adjacent border region (Tajikistan); Joint Field Conference of IGCP-473, IGCP-486 and USGS-GMRAP with project collaborators from Russia, China and Central Asia states (IGCP-502 got invited to jointly assess the VMS mineralization in the Tienshan region).

2006 (Year 5) will be the most important year for the final success of the IGCP-473 project; given travel funding is provided for the seven country coordinators and key researchers from Central Asia, Russia, Mongolia, and China to attend the project business meeting in Summer 2005. Mining industry sponsors of the project research promote mainly research deliverables but not meeting travel expenses.

Dr Reimar Seltmann, Leader IGCP-473 & Director CERCAMS

PROJECT LEADERS: Nigel John Cook (Norway), Kari Kojonen (Finland)
DURATION: 2003-2007

Annual report for 2005

A. Project summary

The project focuses on studies of Au-Ag-telluride-selenide mineralisation of all types (epithermal, magmatic, metamorphic) and attempts to bridge the gap between scientists working in the laboratory and those working in the field from the microscopic- to orogen-scales. The project exploits 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 a successful IGCP project that can encourage the cross-fertilisation needed to obtain maximum use of resources for the collective good. We aim to understand geological processes causing accumulations of Au (± Ag) with Te and Se over space and time, the mineralogy of these deposits and the internal and external controls on metal and mineral distributions. Comparison and analogy between productive and potential regions in Eurasia and worldwide will play an important role in the project. Direct IGCP funding is limited to assisting financially disadvantaged scientists to attend meetings and field excursions/workshops. The IGCP project also acts as a catalyst for appropriate financing from other agencies ranging from national research councils to industrial sponsors.

The rationale of this proposal comes from the idea that studying the exotic trace mineralogy of a deposit can help to better understand the behaviour of precious metals-carriers and fluid paths during gold mineralisation. Despite much published data, many fundamental questions concerning the origin and significance of Te and Se in gold deposits remains poorly understood and imperfectly quantified. Key
questions include, for example: (a) an understanding of the distribution of gold, selenium and tellurium in space and time within magmatic-hydrothermal ores, and the relationships between gold, selenide and telluride mineralization types; (b) to relate physical-chemical information on telluride stability, transport mechanisms and paragenesis with observation and (c) extension of a quantitative thermodynamic database for telluride phases by experimental determination of the stabilities solid phases and aqueous species containing Au, Ag, S, Se and Te.

This is a multi-disciplinary project involving economic geologists, mineralogists and geochemists, backed by both the International Association on the Genesis of Ore Deposits (IAGOD) and the International Mineralogical Association (IMA). Emphasis is placed on knowledge transfer and exchange of information. In the project, we aim to bring together scientists who are investigating, or who are developing innovative qualitative and quantitative methodologies for the study of these types of mineralisation and to encourage them to look beyond the local environments and to compare and contrast on a global scale. The 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 in IGCP 486 is open to scientists working on research of both pure and applied aspects. Particular emphasis will be placed on combining observation, experiment and modelling.

The project is designed as a programme of workshops and symposia where participants can meet and establish collaborative research projects, visit 'classic' gold-telluride districts. Participants will be encouraged to publish their data so that others within the global network can take advantage of new or alternative models or formational mechanisms, and to generally increase awareness in a scientific sub-community often isolated within geographical, political or scientific sub-cultures. In 2003-2004, a network of interested participants from around 40 countries was established, with many individuals expressing the view they had previously believed they were working in isolation.

Goals of the project include publication of at least two thematic special issues of international peer-reviewed journals, and in 2007, preparation of a definitive monograph by invited project participants. Furthermore, a web-based information database on Au-Te-(Se) deposits, their constituent minerals, and origin, will be developed to serve, after completion of the project, as a key product of the project.

The co-ordinating council of IGCP-486 is satisfied with project progress in that a significant body of new scientific data is being produced and published. Furthermore, a growing number of collaborations among members of the IGCP-486 ‘family’ is encouraging. In particular, the exchange between scientists working at opposite ends of the research spectrum covered by the project is bearing fruit, with for example, a growing awareness of the importance of synthetic experiment and thermodynamic calculation by field-oriented researchers.

IGCP-486 works closely with associations active in ore geology and mineralogy in the planning of its activities. Established networks within the International Association on the Genesis of Ore Deposits, IAGOD (national groups, commissions and working groups) have been an effective means to establish networks. IGCP-486 is also linked to the activities of the Commission on Ore Mineralogy of the International Mineralogical Association.

IGCP-486 works closely with IGCP-473 to co-ordinate activities of mutual interest in the countries of Central Asia.

Countries involved in the project

Attendance at meetings and workshops, communication and discussion linked researchers in 33 countries. 22 countries were represented at IGCP-486 activities.

Participating countries are as follows (* contribution at meetings/workshops/publications in 2005; \( {}^f \) funding support for attendance at project activities; \( {}^y \) funding support for young researchers in 2004/2005):

- Argentina*
- Austria*
- Australia*
- Brasil\(^{f,y}\)
- Bulgaria\(^*{f,y}\)
- Canada\(^{f,y}\)
- P.R. China\(^*{f,y}\)
- Colombia
- Czech Republic\(^*{f,y}\)
Participation of scientists from economically-disadvantaged countries; young researchers

An estimated 60% of project participants are from economically-disadvantaged or transition-economy countries, chiefly in SE Europe and the former Soviet Union. A welcome development in 2005 has been the increased participation of scientists from China and South America. This will be intensified as the project progresses.

When distributing IGCP funding, preference is always given to young researchers. In 2004 and 2005, young researchers from several countries have been supported. About 40% of project participants are female; the proportion is larger among young researchers.

B. Meetings, workshops and scientific sessions held in 2004

1. IGCP-486 session at the 7th Biennial Meeting of the Society for Geology Applied to Ore Deposits, Beijing, China, August 20th-23rd 2005

IGCP-486 held a scientific session ‘Metallogeny of Au-Ag-Se-Te Mineralised Systems’ during the biennial SGA meeting ‘Mineral Deposit Research: Meeting the Global Challenge’. The session consisted of 8 oral presentations and 11 posters. Convenors were Nigel Cook (Norway), Zhenhua Zhao (P.R. China), Hidehiko Shimazaki (Japan) and Cristiana Ciobanu (Norway/Australia).

Contributions were published as Chapter 13 (pp. 1377-1454) within the meeting proceedings volume: Mineral Deposit Research: Meeting the Global Challenge (Mao, J.W. et al., 2005), published by Springer, Berlin-Heidelberg-New York, 1613 pp. Each contribution was 3-4 pages in length and all papers were peer-reviewed and edited by Nigel J. Cook. Details are given below.

Special focus during the session was given to gold-telluride deposits in China. The session was attended by ca. 100 persons from ca. 30 (?) countries. Several young researchers presented oral papers. The authors of four papers have been invited to submit full-length manuscripts to the journal Ore Geology Reviews.

The post-meeting field trip to ‘Gold Deposits of the North China Craton’ allowed several IGCP-486 participants to visit one of the major gold districts in China characterised by considerable telluride enrichment. In true IGCP spirit, several participants took ample samples for study and have, since the field trip, communicated with one another on new results and potential new interpretations thereof.

2. Second IGCP-486 Workshop, Bulgaria, 14th-19th September 2005

The workshop was organised by a local organising committee representing the 3 geoscience institutions in Sofia (Kamen Bogdanov, Sofia University “St. Kl. Ohridski”; Ivan Bonev, Geological Institute at Bulgarian Academy of Sciences, Strashimir Strashimirov, University of Mining and Geology “St. I. Rilski”) was held over a six-day period. Participants examined Cretaceous gold-base-metal deposits of epithermal massive sulphide, vein and skarn type in the Panagyurishte and Burgas districts of Bulgaria, and the Adea Tepe and Chala deposits in the Rhodopes Province on the borders with Greece and Turkey. The one-and-a-half day scientific symposium held at the Sofia University field hotel at Kiten consisted of 21 oral presentations. 42 persons, representing 12 countries attended the workshop (Bulgaria, Romania, Greece, Russia, Brasil/Canada, Peru/Sweden, Uzbekistan, Italy, Switzerland and Norway). Additional support for the field workshop was kindly given by the SouthEastern Europe Exploration Foundation allowing numerous students of the Bulgarian universities to attend parts of the workshop.

The scientific contributions were published as a series of extended abstracts in a special issue of the journal ‘Geochemistry, Mineralogy and Petrology (Volume 43; ISSN 0324-1718) under the title ‘Au-Ag-Te-Se deposits, IGCP Project 486; Proceedings of the 2005 Field Workshop, Kiten, Bulgaria. Full contents are given below.
An illustrated field guide was given to each participant and a CD-ROM ‘Proceedings Volume’ containing the field guide together with each of the oral presentations in .ppt format was published in November 2005. The latter was edited by Kamen Bogdanov, Strashimir Strashimirov, Ivan Bonev and Nigel J. Cook and published as Publication 02/05 of the SE Europe Geoscience Foundation (ISBN 954-91716-2-0).

C. Scientific products

Principal publications of IGCP-486 in 2005 include the following:

Mineral Deposit Research: Meeting the Global Challenge (Mao, J.W. et al., 2005), published by Springer, Berlin-Heidelberg-New York, 1613 pp.

Chapter 13: Metallogeny of the Au-Ag-Se-Te mineralized systems IAGOD +IGCP-486 sponsored), pp. 1377-1454
Zonation of Au, Ag, Se and Te in orebodies from the Kochbulak gold-telluride deposit (Uzbekistan). Umid K. Aripov, p. 1379-1382
Bismuth tellurides as gold scavengers. Cristiana L. Ciobanu · Nigel. J. Cook · Allan Pring, p. 1383-1386.
Tellurides in Au deposits: Implications for modeling. Nigel J. Cook · Cristiana L. Ciobanu, p. 1387-1390
New occurrences of gold-porphry type ores in the southeast of East Sayan (Russia). B.B. Damdinov, p. 1391-1394.
Polymetallic assemblages with precious metal tellurides and sulfosalts from the Furtei epithermal Au deposit, Sardinia, Italy: Paragenesis and genetic significance. S. Fadda · M. Fiori · S.M. Grillo · C. Matuzzi, p. 1395-1398.
Ore-forming fluids in gold-telluride deposits in the Pingsyi area, western Shandong, China. Huabin Hu · Jingwen Mao · Shuyin Niu · Fengmei Chai · Yongfeng Li · Mengwen Li, p. 1399-1402.
Au-Ag-Se-Te mineral and geochemical systems in black shale-hosted deposits (Uzbekistan). Rustam I. Koneev · Arpay H. Turesebekov · Evgeniy N. Ignatikov, B.B. Vasilyevsky · R.R. Rakhimov, p. 1403-1406.
The relationship between Carbonaceous chert and selenium enrichment in the Yutangba selenium deposit, China. J. Liu · H. Xie · J. Wang · C. Feng · G. Zhou · Z. Li, p. 1407-1410.
The telluride mineralization event(s) within the late-variscan gold deposits in the western Sudetes (NE part of the Bohemian massif, SW Poland). S.Z. Mikulski, p. 1415-1418.
Occurrence and paragenesis of tellurium in mineral deposits of Argentina. W.H. Paar · H. Putz · D. Topa · M.K. de Brodtkorb · R.J. Sureda, p. 1419-1422.
Genesis and geochemistry feature of carbonaceous siliceous rocks in Shuanghe Se-deposit, Enshi, Hubei province, China. Qian Handong · Zheng Xiang · Wu Xuemei, p. 1423-1426.
Progress in developing Te-Xe dating of ore minerals. H.V. Thomas · R.A.D. Pat trick · J.D. Gilmour, p. 1427-1430.
Gold – telluride ore mineralisation in the Chatkal-Kurama region: The case of the Samarchuk deposit. Akromiddin Z. Umarov, p. 1431-1434.
Mineralogy of the high-sulfidation Cu-Sb-Te Mavrokoryfi prospect (western Thrace, Greece). Panagiotis Voudouris, p. 1435-1438.
Synthetic palladium tellurides, their structures and mineralogical significance. A. Vymazalová · P. Ondrus · M. Drábek, p. 1439-1442.
Bulong quartz-barite vein-type gold deposit in the Xinjiang Uygur autonomous region, China. Fuquan Yang · Jingwen Mao · Caishang Zhao · Yitian Wang, p. 1443-1446.
Ore geology and fluid-system of the Yindonggou Ag deposit, Henan: Implications for genetic type. Zhang Jing · Chen Yan-jing, p. 1447-1450.
Au-Te deposits associated with alkali-rich igneous rocks in China. Zhao Zhenhua · Zhang Peihua · Xiong Xiaolin · Wang Qiang, p. 1451-1454.

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Au-Ag-Te-Se deposits, IGCP Project 486 ‘Proceedings of the 2005 Field Workshop, Kiten, Bulgaria’

D. Alfieris, P. Voudouris - Ore mineralogy of transitional submarine to subaerial magmatic-hydrothermal deposits in Western Milos, Greece, p. 1-6.
E. Belougub, K. Novoselov, V. Zaykov - Gold-silver paragenetic evolution in ore deposits of the Magnetogorsk paleoisland arc, Southern Urals, p. 7-12.
K. Bogdanov, A. Filipov, R. Kehayov - Au-Ag-Te-Se minerals in the Elatsite porphyry-copper deposit, Bulgaria, p. 13-19.
S. Bondarenko, O. Grinchenko, V. Semka - Au-Ag-Te-Se mineralization in the Potashnya gold deposit, Kocherov tectonic zone, Ukrainian Shield, p. 20-25.
I.K. Bonev, R. Petrunov, R. Atanassova - Filamentary native gold from the Elatsite porphyry Cu-Au deposit, Srednogorie zone, Bulgaria, p. 26-34.
R. Cabral, G. Beaudoin, B. Lehm ann, H.F. Galbiatti - S/Se ratios in palladiferous gold coexisting with palladseite, Cauê iron ore deposit, Itabira district, Quadrilátero Ferrifero of Minas Gerais, Brazil, p. 35-40.
D.A. Chareev, E.G. Osadchii - Pyrrhotite-pyrite equilibria in the Ag-Fe-S system at 245 to 310°C and standard pressure, p. 41-46.

C.L. Ciobanu, N.J. Cook, N. Capraru, G. Damian, P. Cristea - Mineral assemblages from the vein salband at Sacarimb, Golden Quadrilateral, Romania: I. Sulphides and sulphosalts, p. 47-55.

N.J. Cook, C.L. Ciobanu, N. Capraru, G. Damian, P. Cristea - Mineral assemblages from the vein salband at Sacarimb, Golden Quadrilateral, Romania: II. Tellurides, p. 56-63.

D. Costin, Ş. Vlad - Ore formation at Varatec-Baiut, Baia Mare region, East Carpathians, Romania, p. 64-68.

E.A. Dunin-Barkovskaya, U.K. Aripov, L.A. Tsyo, M.A. Kim - Mineralogical features and ore-forming conditions of gold-bearing deposits of Uzbekistan, p. 69-74.

E.A. Echmaeva, E.G. Osadchii - Thermodynamic properties of phases in Ag-Au-X system, where X = S, Se, Te, p. 75-78.

S. Fadda, M. Fiori, S.M. Grillo - Chemical variations in tetrahedrite - tennantite minerals from the Furtei epithermal Au deposit, Sardinia, Italy: Mineral zoning and ore fluids evolution, p. 79-84.

O. Grinenko, S. Bondarenko, V. Semka - Gold-telluride associations in the Lower Paleozoic Sauljak deposit, Ukrainian Carpathians, p. 85-86.

H.M. Helmy, C. Ballhaus, J. Berndt-Gerdes - The formation of Pt, Pd and Ni tellurides during cooling of Fe-Ni-Cu sulfide: Results of experiments and implications for natural systems, p. 87-92.

N. Hewson, S. Leary, N. Feier - Tarina and Rodu: Gold mineralisation hosted in maar-diатremе contact environments in the Apuseni Mountains, Romania, p. 93-101.

R. Koneev, E. Ignatikov, A. Turesebekov, U.К. Aripov, R. Khalmatov, M. Usmanov - Gold ore deposits of Uzbekistan: Geochemistry and nanomineralogy of tellurium and selenium, p. 102-106.

K. Kouzmanov, K. Bogdanov, C. Ramboz - Te- and Bi-bearing assemblages in the Elshita and Radka epithermal deposits, Central Srednogorie, Bulgaria: Mineralogy and genetical features, p. 108-112.

K. Kouzmanov, A. von Quadt, I. Feytcheva, C. Harris, C.A. Heinrich, E. Roșu, G. O’Connor - Rosia Poieni porphyry Cu-Au and Rosia Montana epithermal Au-Ag deposits, Apuseni Mts., Romania: Timing of magmatism and related mineralization, p. 113-117.

V.A. Kovalenker, O.Yu. Plotinskaya - Te and Se mineralogy of Ozernovskoe and Prasolovskoe epithermal gold deposits, Kuril-Kamchatka volcanic belt, p. 118-123.

V.S. Melmikov, S. Bondarenko, O.V. Grinenko - Conditions of Bi-telluride formation in Vygorlat-Huta volcanic ridge, Transcarpathian region, Ukraine, p. 124-127.

R. Migineishvili - Hybrid nature of the Madneuli Cu-Au deposit, Georgia, p. 128-132.

L. Nadasan, F. Nadasan - Gold mineralisation in hydrothermal-breccia from Southeastern part of Frasin deposit, Bucium district, Apuseni Mountains, Romania, p. 133-137.

K. Novoselov, E. Belogub - Gold-polymetallic mineralisation of the Il’iniske ore field, South Urals, p. 138-141.

O.Yu. Plotinskaya, V.L. Rusinov, V.A. Kovalenker, R. Seltmann - Oscillatory zoning in goldfieldites as a possible indicator of their formation conditions, p. 142-146.

I. Vikentyev, R. Banda, A. Tsepin, V. Prokofiev, O. Vikentyeva - Mineralogy and formation conditions of Portovelo-Zaruma gold-sulphide vein deposit, Ecuador, p. 148-154.

P. Voudouris, C. Papavasiliou, V. Melfos - Silver mineralogy of St. Philippos deposit (NE Greece) and its relationship to a Te-bearing porphyry-Cu-Mo mineralization, p. 155-161.

The issue was accompanied by a paper in volume 42 (p. 1-22) of the same journal ‘Kostovite and its argentian varieties: Deposits and mineral associations’ by I.K. Bonev, R. Petrunov, N.J. Cook and C.L. Ciobanu in memory of the Bulgarian mineralogist/geologist Ivan Kostov (1913-2004).

Eight papers presented at the session G14.07 ‘Telluride and selenide minerals related to gold- and platinum-group elements’ at the 2004 IGC and at the Alba Iulia workshop in September 2004 are accepted for publication as a special issue of the journal Mineralogy and Petrology (Guest-editors: Paul G. Spry, Cristiana Ciobanu, Nigel J. Cook). The eight papers include contributions from author teams in (i) Spain, (ii) United States, (iii) Norway-Australia, (iv and v) Russia, Russia, (vi) Russia-United Kingdom, (vii) Greece and (viii) P.R. China.

The following meeting report was published in the IUGS journal ‘Episodes’:

Cook, N.J. (2005): Meeting report. 1st Field Workshop of IGCP-486, Alba Iulia / Apuseni Mts., Romania, September 2004. Episodes 28, 210-212.

**D. Achievements of the project (2003-2005)**

The two successful activities in 2004 (all-day session at the Florence IGC, Field workshop in Romania) were attended by a total of about 100 persons, with a total of more than 60 presentations. These were followed by two similarly successful meetings in 2005. These four meetings, plus a business meeting of the project during the IGC allowed the goals of the project to be better defined and collaborative projects developed. It was fairly argued that, from a geographical perspective, the project cannot address all areas of the world, but should concentrate on (i) SE
Europe, with a clear goal of integrating researchers from Bulgaria, Romania, Turkey, Greece, Italy, Slovakia, Ukraine and Poland (+Georgia, Serbia-Montenegro); (ii) Russia and central Asia – largely carried out in conjunction with IGCP-473 and (iii) China (+Korea, Japan). A problem identified in the last evaluation of IGCP-486 was how to integrate more geographically-isolated participants, particularly those from South America, whose contributions so far have been largely in the form of e-mail communication (from scientists in Argentina, Brasil, Colombia, Peru). The rectify this, the basis for a field workshop in Peru in 2007 was laid during the Bulgaria workshop in Autumn 2005. Peru was chosen because of its central location and relatively easier logistics for visiting multiple deposits in a short time period.

Four sets of extended abstracts have now been published. The first special issue of journal papers (in Mineralogy and Petrology) is nearing completion, and a second (in Ore Geology Reviews) will be started soon. A strategic plan for completion of a final monograph (Geological Society Special Publication) is in preparation, with contributing individuals targeted.

Work on the project database has begun and will be completed subject to external funding (see below). An application for an INTAS project designed to address fundamental problems of telluride-selenide mineralogy in Central Asia, and consisting of participating teams from Russia (3 teams), Uzbekistan, Norway, U.K. and Switzerland was evaluated by the EU during 2004 but was not awarded. Australian participants have succeeded with a large-scale linked research council application targeting experimental work on the transport of tellurium in the vapour phase.

The greatest effort has been placed in lining up an attractive number of events for the final years of the project (see below). This has been achieved by building networks, and encouraging individual participants to play active roles in the project by agreeing to host future events, and to contribute to joint research projects. The forthcoming workshops in Uzbekistan and Turkey will further allow project goals to be realised.

Educational, training or capacity building activities

IGCP-486 is a research network allowing individuals and research teams the opportunity for interaction through its meetings and workshops. The project leads, indirectly, to competence-building by transfer of knowledge and joint programmes of research cooperation. Giving the opportunity for scientists to visit other parts of the world is an essential part of the educational benefits of this project.

Participants are encouraged to present results of IGCP-486 in the popular science media. The undersigned gave a talk on ‘Modern approaches to Telluride Deposits’ in Oslo in November 2005, which stimulated a surprising level of interest in the private mineral collecting community, which, alongside museums, represent an important source of study material.

An important milestone in IGCP-486 will be the workshop to be held in Moscow in July 2006. The objective is to give geologists and mineralogists with an essentially field-based background the opportunity to interact with a team of experts in experimental geochemistry and thermodynamics. The objectives of this workshop are twofold: firstly to expose participants (largely drawn from the geological or mineralogical community) to the latest cutting-edge research carried out on the experimental geochemistry of gold by Russian and Western researchers; and secondly to provide real-life examples to the experimentalists and identify problems which can be solved by interaction of the two communities.

E. Workplan for 2006

1. General goals

IGCP-486 seeks to increase awareness and encourage interaction among scientists working at different scales and within different areas of expertise. This will be further developed in 2006 and 2007. In particular, the project represents a forum for participants to discuss and exchange ideas and for participants in developing countries to meet individuals in developed countries and establish the basis for collaboration and research visits. No such foundation existed prior to the start of the project and the positive results are beginning to show, with several bilateral research projects established on the basis of initial contact via IGCP-486.

One important goal of IGCP-486 is the realisation of a web-based database covering the global distribution of gold-(silver)-telluride-(selenide) deposits. Although individuals and national groups have contributed information and maps, the database has not yet been implemented due to lack of funds and resources. The undersigned has submitted a research proposal to the Norwegian Research Council (submitted June 2005, response anticipated
2. Meetings, workshops and scientific sessions

2006 is the critical ‘middle year’ of the project and features more activities than in the previous two years. In all activities planned for 2006, there will be a high level of participation by scientists from developing countries.

**Joint IAGOD & IGCP-473/486 Field Workshop ‘Porphyry and Epithermal Deposits of the Chatkal-Kurama Region, Uzbekistan, 22-30 April 2006, Tashkent and Almalyk, Uzbekistan**

Preliminary schedule: 22 April - Arrival Tashkent; 23-24 April - IGCP-473/486 workshop in Tashkent (2 days); 25 April - Transfer Tashkent – Almalyk; 25-29 April - Field excursion (4 days) to Chatkal-Kurama region, visiting Kalmakyr-Dalnee, Sarycheky, Kochbulak etc.; 30 April - Departure

Organized by: National University of Uzbekistan, Almalyk Mining-Metallurgical Enterprise, National Committee of Geologists of Uzbekistan and CERCAMS NHM London. This event was originally scheduled to happen in 2005 but was postponed for political/security reasons.

IGCP-486 has, in Central Eurasia, a close cooperation with IGCP-473 “Metallogeny of Central Asia” that has a focus on the metallogeny of this region of economic importance, and contains some of the worlds richest and largest telluride-bearing gold deposits. The joint field conference in Uzbekistan aims to jointly synthesize complementary studies in Central Asia. Both projects carry out jointly with teams from IGem RAS Moscow, IMR Tashkent and Uzbek Academy of Sciences a collaborative case study in the Chatkal-Kurama region (Uzbekistan), hosting important Cu-Au-Ag-Se-Te mineralization and deposits of porphyry, epithermal and mesothermal style (Almalyk-Kalmakyr, Kochbulak, etc.). The anticipated participation also of Chinese scientists involved in IGCP-486 will offer a further dimension to this workshop.

**19th General Meeting of International Mineralogical Association, Kobe, Japan, July 2006**

Several IGCP-486 presentations will be given within the framework of a session convened by thee Commission on Ore Mineralogy of the International Mineralogical Association (IMA-COM) ‘Ore Mineralogy’ to be held during the 19th IMA General Meeting in Kobe, Japan, July 23-28th 2006. Conveners are: M. Shimizu (Japan), K. Kojonen (Finland), R. Merkle (South Africa) and N. Cook (Norway).

**International Field workshop: ‘Carpathians and Ukrainian Shield, Ukraine’, August 2006, Kiev-Muckachevo-Uman-Kirovograd, Ukraine**

The meeting is organised by the Ukrainian National Group of IAGOD with the participation of IGCP-486. The workshop is aimed at understanding the geology, mineralogy and metallogenesis of Archaean and Proterozoic orogenic gold deposits in the Ukraine Shield and Neogene gold-base metal deposits at Muzhievsk in the Beregovo area (Transcarpathian region). The workshop consists of a six-day field excursion to the Carpathians, a three-day field excursion around the Ukrainian Shield, scientific sessions, social program, and more. First and second circulars are available at [http://www.ukriagod.kiev.ua/start-eng.htm](http://www.ukriagod.kiev.ua/start-eng.htm). Supporting agencies include The Geological Survey of Ukraine, National Academy of Sciences, Mining-processing companies and regional administrations of the Transcarpathian, Vinnytsa and Kirovograd state regions. A field trip guide will be prepared, edited and published by IAGOD in their guidebook series, in association with IGCP-486.

**12th IAGOD Quadrennial Symposium, St. Petersburg, Russia, August 2006.**

IGCP-486 will organise a scientific session as part of the 2006 12th IAGOD Quadrennial Symposium ‘Understanding the Genesis of Ore Deposits to meet then demands of the 21st Century’, to be held in Moscow, Russian Federation, 21st-24th August 2006. This will be the major ore geology meeting held in 2005 and will likely be attended by 450-550 participants. Keynote lectures will be chosen to represent both Russian and Western European/North American approaches.

**IGCP-486 ‘Laboratory’ workshop on experimental and theoretical aspects of telluride-gold deposit formation, Moscow, Russian Federation, April 2006**

The workshop, which will immediately follow the above IAGOD Quadrennial Symposium, will bring together a number of experts from Russia and from western countries. The workshop aims to bridge the gap between scientists working in the laboratory on experimental or theoretical aspects of Telluride-Selenide Au-Ag- deposits.
formation and those working in the field studying and documenting deposits currently under exploitation or exploration. The workshop has received support from the Institute of Geochemistry and Experimental Mineralogy of the Russian Academy of Sciences (IGEM-RAS), led by Drs. Nikolai Bortnikov and Vladimir Kovalenker, Director and Deputy Director respectively. IGEM-RAS will co-sponsor the workshop.

A volume of extended abstracts, and longer papers on the invited talks, will be published by IGEM, in both English and Russian.

Field Workshop, Izmir, Turkey, 24-29 September-2006

The Turkish working group of IGCP-486 have invited the project to attend a workshop/symposium in Izmir in September 2006, to be organised by Prof. Ismet Ozgenc, Turkish IGCP-486 representative, and his colleagues, Dokuz Eylul University. The first circular was issued in October 2005; The Local organising committee hopes to persuade local mining companies to co-sponsor the event.

The workshop will follow the following programme: Sunday (September-24) Arrival at Izmir Registration / Dokuz Eylul University-Izmir; Monday (Sept. 25th): Field trip Day 1 - Izmir-Esmef(Uşak). Visit of Kışladağ-Porphyry Au deposit. Night in Izmir; Tuesday (Sept. 26th): Field trip Day 2 - Visit of Ovacık (Izmir) Au LS epithermal deposit, Night in Izmir; Wednesday (Sept. 27th): Field trip Day 3 – Visits to other deposits in the Izmir area, Night in Izmir.

The scientific session will be held 28-29 September 2006 in Izmir.

The workshop will allow participants to visit a number of deposits, including recent discoveries. The organisers are particularly hoping that the workshop, the first in this area of Turkey, will open avenues for regional correlation.

3. Other activities, scientific output, research projects

Initiation of the web-based database with summaries and status reports of existing knowledge on telluride-/selenide-bearing deposits, deposit and province descriptions and a 'databank' of information on Au-Te-(Se) deposits and their constituent minerals, with maps, genetic interpretations and photomicrographs. A comprehensive indexed bibliography will be introduced, so that the website can be used as a resource by IGCP-486 participants and others.

Completion of the first and second special issue projects; initiation of monograph preparation.

4. Perspectives for 2007 and 2008

2007 (Year 5) will be an equally important year for the IGCP-473 project. We will hold a field workshop in Peru focussing on telluride-bearing gold-silver deposits in the Andes. Mining industry sponsors will be sought but IUGS/Unesco support for key IGCP-486 participants is essential for the success of the project.

A second workshop will be held in Finland (possible excursion targets would be Kutemajärvi (Orivesi), Pampalo (Ilomantsi), Kuusamo and Oijarvi).

For 2008, IGCP-486 will seek an additional year. This will primarily allow us to hold a final scientific meeting during the 33rd International Geological Congress in Oslo, Norway. The session will be coupled to completion of the IGCP-486 database and publication of the final project monograph (see above).

Nigel J. Cook
Principal coordinator, IGCP-486
Professor, NHM /Geological Museum, University of Oslo, Norway

ANNOUNCEMENT

Joint IAGOD & IGCP-473/486 Field Workshop
Porphyry and Epithermal Deposits of the Chatkal-Kurama Region, Uzbekistan
22-30 April 2006, Tashkent & Almalyk, Uzbekistan

Preliminary schedule
22 April - Arrival Tashkent
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30 April - Departure

Organized by:
National University of Uzbekistan
Almalyk Mining-Metallurgical Enterprise
National Committee of Geologists of Uzbekistan
CERCAMS NHM London

Registration Fee (covering all local expenses incl. meals, hotel, field transport): approx. 1000.- USD

For further details, please visit: http://www.nhm.ac.uk/research-curation/projects/cercams/

INTERNATIONAL ASSOCIATION
ON THE GENESIS OF ORE DEPOSITS (IAGOD)

Ukrainian National Group (UkrIAGOD)
INTERNATIONAL FIELD WORKSHOP
"Carpathians and Ukrainian Shield, Ukraine"
12th - 20th August 2006
Invitation
The Organizing Committee has the honour of inviting you to attend the International Field Workshop "Carpathians and Ukrainian Shield" will be held on August 12-20, 2006 in Ukraine.

The workshop consists of a six-day field excursion to the Carpathians, three-day field excursion around the Ukrainian Shield, scientific sessions, social program, and rocks, map, and publication displays.

The first excursion provides the opportunity to visit epithermal gold deposits of the Transcarpathian region.

The second trip will allow participants to visit graphite and uranium deposits, as well as to observe drill cores from the different types of orogenic gold deposits of the Ukrainian Shield.

Scientific sessions will focus on a wide range of genetic problems of epithermal gold deposit formation as well as, in particular, deposits of the Ukrainian Shield.

Contributions include three invited lecturers: Dr. N.J. Cook (IAGOD and IGCP-486 project, Norway), Dr. R. Seltmann (CERCAMS and IGCP-473 project, UK), and Dr. W. Nokleberg (GMRAP, USA). The program of scientific sessions will be sent to registered workshop participants separately.

Social program includes walk-tour to the Sofievka park, Uman (August 17).

Tentative Schedule

Excursion A
Carpathian region
from 12th to 17th August

Day 1: August, 12th, Saturday. Arrival at Kiev; Travel Kiev-Muckachevo by train.
Day 2: August, 13th, Sunday. Arrival at the Muckachevo railway station at 10 a.m., Bus trip to the Muzhievo gold deposit and examination of the gold mine. Return to Muckachevo, settlement at the hotel. Discussion about the excursion; Supper
Day 3: August, 14th, Monday. Breakfast; Bus trip from Muckachevo to Dilove village. Lunch; Excursion tour to the Saulyak gold deposit. Bus trip to Rakhiv (or Kvasyv village). Settlement at the hotel, Evening session, in accordance with the workshop program. Supper.

Day 4: August, 15th, Tuesday. 8-9 a.m. - breakfast; 9 a.m. - 1 p.m. - examination of general geology in around the Rakhiv Massif. 1-3 p.m. - lunch. 3-7 p.m. - plenary session in accordance with the workshop program. 7-8 p.m. - supper.

Day 5: August, 16th, Wednesday. 8-9 a.m. - breakfast; 9 a.m. - 1 p.m. - examination of geology and mineralization sites in around the Rakhiv Massif. 1-3 p.m. - lunch. 3-7 p.m. - plenary session in accordance with the workshop program. 7-8 p.m. - supper.

Day 6: August, 17th, Thursday. 8-9 a.m. - breakfast. Bus trip from Rakhiv (or Kvasyv) to Uman (Kirovograd region). Settlement at hotel. Lunch. Excursion to the Sofievka park. Evening session, in accordance with the workshop program. Supper.

Excursion B
Ukrainian Shield
from 18th to 20th August

Day 7: August, 18th, Friday. 8-9 a.m. - breakfast. 9 a.m. - 7 p.m. - tour to Zavalie graphite deposit. Lunch. Examination of drill cores from the Mayske, Klintsy, Sergiivske, Balka Zolota and Balka Shyroka gold deposits. Return to the hotel in Uman; 8-9 p.m. - supper.

Day 8: August, 19th, Saturday. 8-9 a.m. - breakfast. 9-10 a.m. - bus trip from Uman to Kirovograd. 10 a.m. - 6 p.m. - underground tour of the Michurinske uranium mine. 7-8 p.m. - discussion of the workshop results. 8-11 p.m. - supper. 12 p.m. - 6 a.m. - bus trip from Uman to to Kiev.

Day 9: August, 20th, Sunday. 6 a.m. - arrival to Kiev. Departure of the Workshop participants.

Registration fees* (in US dollars)
Items

Prices in black are for registrations before May 1th, 2006, prices in red after May 1th, 2006 and on-site

| Items                                                      | Before May 1th, 2006 | After May 1th, 2006 |
|------------------------------------------------------------|----------------------|---------------------|
| Workshop participant from EU, North America, Australia etc. | 500                  | 570                 |
| Student participant from EU, North America, Australia etc. ** | 150                  | 200                 |
| Workshop participant from Ukraine, NIS, E. Europe, developed countries ** | 150                  | 200                 |
| Student participant from Ukraine, NIS, E. Europe, developed countries ** | 100                  | 150                 |

*Registration fee includes payment for accommodation, transportation, meals, excursion routes, guidebook, translations service, and social program (walking-tour in the Sofievka park, Uman).

** Financial support for this nominal fee may be applied for. Applicants will be selected by scientific qualifications and financial need; priority will be given to scientists/students who wish to contribute a presentation during scientific session, or work in the visited study region.

Applicants are welcome to complete and submit the registration form, and send it (e-mail is preferable) to the Workshop secretary contact address before March 15, 2005. A brief CV with list of publications, and a letter from the applicant's supervisor/Head of the institution must be attached.

Registration Procedure
Please find enclosed REGISTRATION FORM to fill it up and send to the Organizing Committee as soon as possible

ATTENTION!!!
Payments: Details of the Organizing Committee bank account will be given later.
Organizing Committee

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Nigel J. Cook
Centre for Russian and Central Asian Mineral Studies (CERCAMS),
and IGCP-473 project, NHM London, UK

Secretary
Inna V. Mudrovska
Ukrainian State Geological Research Institute (UkrSGRI)
Avtozavodska Str., 78, 04114, Kiev, Ukraine,
tel. +380 66 734 43 37
fax +380 44 430 41 76
E-mail mudrovska@hotmail.com
SMS 7344337@sms.jeans.net.ua

Executive members
Alexander K. Babynin
Muzhievo Gold-Refining Industrial Complex, Ukraine
Mykola A. Kozar
State Regional Geological Enterprise "Pivdenukrgeologia", Ukraine
Oleg F. Makivchuk
State Geological Enterprise "Kirovgeologia", Ukraine
Boris I. Malyuk
Ukrainian State Geological Research Institute (UkrSGRI)
Volodymyr A. Mykhailov
Kyiv National University, Department of Geology, Ukraine
Warren Nokleberg
Global Mineral Resource Assessment Program, USGS, USA
Vasyl L. Prykhodko
State Geological Enterprise "Pivnichgeologia", Ukraine
Vasyl M. Shklanka
Trans-Carpathian Geological Exploration Expedition, Ukraine
Leonid Z. Skakun
Lviv National University, Department of Geology, Ukraine
Vasyl M. Zagnitko
Institute of Geochemistry and Ore Formation, NAS of Ukraine

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http://www.esfs.org/index.htm

International Year of Planet Earth

http://www.esfs.org/index.htm
Earth Sciences for Society - an International Year of Planet Earth

The International Union of Geosciences (IUGS), representing about 250,000 geoscientists across 117 countries, has taken the initiative to proclaim an International Year of Planet Earth 2007 - 2009 with the subtitle Earth Sciences for Society.

Its purpose will be to focus on the relationship between humankind and Planet Earth, and to demonstrate that geoscientists are key players in creating a balanced, sustainable future for both.

The General Assembly of the United Nations have proclaimed 2008 as the UN Year of Planet Earth. On the 22nd of December the UN General Assembly adopted by consensus a Resolution by the United Republic of Tanzania and co-signed by 82 nations, to proclaim 2008 as the UN Year of Planet Earth. The press release issued by the UN after adoption of the Resolution, reads as follows:

"By a draft on the International Year of Planet Earth, 2008, which the Committee approved without a vote on 11 November, the Assembly would declare 2008 the International Year of Planet Earth. It would also designate the United Nations Educational, Scientific and Cultural Organization (UNESCO) to organize activities to be undertaken during the Year, in collaboration with UNEP and other relevant United Nations bodies, the International Union of Geological Sciences and other Earth sciences societies and groups throughout the world. Also by that draft, the Assembly would encourage Member States, the United Nations system and other actors to use the Year to increase awareness of the importance of Earth sciences in achieving sustainable development and promoting local, national, regional and international action."

In fact, the International Year of Planet Earth will be a triennium, starting in 2007 and closing by the end of 2009, with the UN Year of Planet Earth 2008 in the centre.

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The book describes properties of over 4,200 minerals from about 8,500 world’s localities (including their alphabetic list), with emphasis on their geoenvironment.