

International Association of Geochemistry and Cosmochemistry

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NEWSLETTER

27 pp.

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SEPTEMBER 1983

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FOR THE PERIOD 1981 - 1983.

During the current year the Commission proceeded to develop its activity on attracting world scientists to the problems of geochemistry of natural waters, which are considered to be very actual nowadays. Presently it's extremely important to know natural laws of formation and development of waters' chemical composition. Without special knowledge of these regularities it's impossible to organize struggle against pollution on a proper scientific level. According to the plans of the Commission the Second International symposium on geochemistry of natural waters took place in Rostov-on-Don in May, 1982. *Proceedings?*

? Simultaneously necessary steps were undertaken towards the organization of WRL-4 Symposium in Misasa.

Commission and its subgroup 5 (chairman - corresponding member of the Ukrain Academy of Sciences - G.G.Polokarpov) are organizing the second international symposium on Water-Living Matter Interaction. Originally it was planned to be held in Yugoslavia (Prof.Rodoslavlevich), but because of some circumstances they decided to convene it in the USSR. They are negotiating on the possibility to organize it in the USSR.

? Chairman of the subgroup 1 - ^{title?} Dr.R.Veiler (elected in 1-975) was not active enough, so it was decided to elect Prof.A.M.Nikanorov (Director of Hydrochemical Institute in Rostov-on-Don) to this post. Prof.A.M.Nikanorov is an active scientist who works in the field of geochemistry of natural waters and its protection. There are all reasons to reckon upon his energy and hope that he will ^{re-}survive the activity of this subgroup and put it on the proper level.

Commission is taking part in the organization of Symposium

16.2.2. "Trace-Element Geochemistry of Under-ground Drinking Water" of the 27th International Geological Congress.

Besides, Commission is also organizing different local symposia. So, under the initiative of the Committee in November 1983 the Soviet-Czechoslovakian seminar will take place in Prague. It'll be devoted to the hydrogeochemical problems. The organizer is Central Geological Institute in Prague, the convener is Dr. Tomas Paces.

/ The seminar on biogeochemistry /Leningrad 1983 or 1984/ is also preparing.

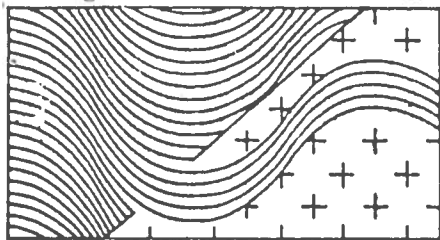
Much is done for publication of the proceedings of the Second International Symposium on Geochemistry of Natural Waters in Rostov-on-Don.

Dr. B. Hitchon, Chairman of the subgroup 4 proposed some reorganizations of the Commission. Subgroup 4 - WRI - is the largest and the most active one, which comprises great number of scientists and certainly needs some reforms.

Commission on geochemistry of natural waters again appeals to the IAGC that it's high time to convene an International Congress on Geochemistry of Natural Waters, where main problems of studying natural waters would be discussed, as well as regularities of the formation of waters' composition in natural conditions and processes, which lead to the alteration of them. These main branches in geochemistry of natural waters should be considered as a basis in struggle for preservation of waters on the Earth

The preliminary time for convocation of such a congress is 1985. We hope that IAGC will appreciate such initiative and in this case Commission will immediately start with its organization.

Chairman of the Commission on
Geochemistry of Natural Waters. *M. A. B. B. B.*



INTERNATIONAL

Interest Group on Water-Rock Interaction

International Association of Geochemistry and Cosmochemistry

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II - Report to IAGC Council
Tokyo, Japan, 1983

WRI continues to function smoothly and efficiently. At this date preparations are in the final stages for the Fourth International Symposium on Water-Rock Interaction (WRI-4), which will be held immediately following the Council meeting. All Council members are invited to participate - the registration fee, banquet charges and mid-session field trip fee have all been waived. The Secretary-General, Dr. Hitoshi Sakai, has done an excellent job and it looks as though his efforts have paid off, because the world-wide recession does not appear to have affected, in any significant way, the attendance or the wide range of papers submitted. He has been particularly successful in obtaining Japanese travel support funds, and so the UNESCO grant of \$6000, obtained through IAGC, has been allocated effectively entirely to the most needy, especially to members in countries such as The People's Republic of China and South Korea not previously represented at WRI Symposia.

The proposed WRI Constitution and By-Laws has received the review of all Interest Group Chairmen and National Contacts and has been revised accordingly, ready for presentation at the WRI-4 Business Meeting. A new, more detailed, application form and a newsletter were sent out to all members on 1983-03-20. At this date, more than two hundred members have replied and the data are being compiled for a revised membership mailing list and a World Directory of WRI Members, complete with a key-word index of research in progress.

The interim Nominating Committee have made their recommendations for the Executive Committee for 1983-86, which will be voted on at the WRI-4 Business Meeting. Despite repeated letters and a cable, no reply has been received from Iceland, which was invited to host WRI-5 in 1986. Plans are now underway to change the venue to England, and failing that it will be up to the new Executive Committee to find a home for WRI-5.

Brian Hitchon
Chairman, WRI
1983-06-17

III - Report of the Working group on geochemical prospecting, IAGC, for the period of December 1981-July 1983

From the time of the III Symposium on methods of applied geochemistry (Irkutsk, Sept.-Oct., 1981) the activity of the group has been focused upon three main directions:

(I) The issue of works of the II Symposium. To the publishing House 'Nauka' (Novosibirsk, USSR) have been delivered 6 volumes in Russian. In 1983 the issue of the following volumes is planned:

- 4 - The scientific foundation of the applied geochemistry.
- 5 - The geochemical prospecting on primary halos.
- 6 - The hydrogeochemical methods of prospecting of ore deposits.

The other three ones should be issued in 1984:

- The geochemical methods of prospecting and assessment of ore deposits.
- The mathematical processing of geochemical data.
- The geochemical prospecting in regions of the Precambrian consolidation.

(II) The carrying out of a school-seminar on geochemical methods of prospecting in the town Ulan-Bator (Mongolia) for Mongolian specialists and those of other countries working in Mongolia (Dec.6 - Dec.15, 1982). The organization was led by a member of the working group Dr.O.Gerel (Mong.Polytech.Institute). Financing was done by the Ministry of geology and Mining industry of the Mongolian Republic. The chairman of the seminar was the one of the Working group Academician L.V.Tauson and the member of the group Prof.V.V.Polikarpochkin.

The Programme included:

1. The geology and metallogeny of Mongolia.
2. The petrologo-geochemical principles of the metallogeni

analysis.

3. The geochemical methods of prospecting deposits of useful minerals.

4. Consultations.

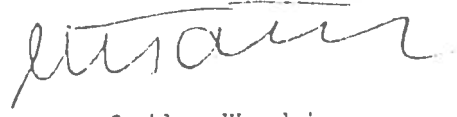
The lectures on geology and metallogeny of Mongolia have been held by known Mongolian specialists. The experience of this seminar maintains that such schools are efficient and economic as a preparation of the national geochemical staff in developing countries.

(III) The preparation of the first joint symposium with the Association of Exploration Geochemists: X International Geochemical Exploration Symposium - III Symposium on Methods of Geochemical Prospecting (Espoo-Helsinki, Finland, August 29-September 2, 1983).

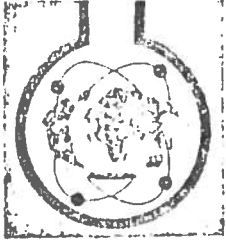
In the period of the Symposium is planned a Session of the Working group on geochemical prospecting, IAGC, its joint session with the Council of the Association of Exploration Geochemists, and also a discussion on the participation of geochemists in the Programms of International aid and professional education and other actual questions of the applied geochemistry.

July 25, 1983,
Irkutsk

Academician I.V. Tauson



Chairman of the Working group



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IV - Annual report IAGC Commission of Extraterrestrial Geochemistry, period of 1982 - 1983.

The Commission has organized a Symposium "From Asteroids to Meteorites", to be held on September 7 and 8, 1983 in conjunction with the 46th Annual Meeting of the Meteoritical Society in Mainz, F. R. Germany.

The following topical areas will be addressed:

- 1.) Chemistry of asteroid surfaces as revealed by spectrophotometry.
- 2.) Nature of asteroidal regoliths as revealed by meteorite studies.
- 3.) Mechanics of fragmentation.
- 4.) Theoretical and cosmic-ray exposure evidence for a series of fragmentation events.
- 5.) Dynamical processes for transfer of fragments into Earth-crossing orbits.
- 6.) Entry of meteoroids into the atmosphere, atmospheric selection, and recovery of meteorites.

Conveners: H. Wanke and G. Wetherill

During the meeting the Commission will held its first assembly after H. Wanke took over the chairmanship. During this meeting the future activities will be discussed.

IAGC Commission of Extraterrestrial Geochemistry

List of books published 1982 - 1983

"Meteorites - A petrologic-chemical synthesis" by R. T. Dodd,
Cambridge University Press, (1981).

"Cosmology - The Science of the Universe" by E. R. Harrison, Cambridge University Press, (1981).

"Planetary Science: A Lunar perspective" by S. R. Taylor, Lunar and
Planetary Institute, Houston, (1982).

"Inorganic Geochemistry" by P. Henderson, Pergamon Press, Oxford,
(1982).

"Planetary Exploration" by H. Massey, S. K. Runcorn, J. E. Guest, G.
E. Hunt, M. M. Woolfson (Eds.), The Royal Society, London
(1982).

"The Earth's core: Its structure, evolution and magnetic field." by
S. K. Runcorn, K. M. Creer, J. A. Jacobs (Eds.), The Royal Society, London (1982).

"Proceedings of the 13th Lunar and Planetary Science Conference",
Part I, by W. V. Boynton, T. J. Ahrens (Eds.), Suppl. Journal
of Geophysical Research, Vol. 87, pp. A1 - A480 (1982).

"Proceedings of the 13th Lunar and Planetary Science Conference",
Part II, by W. V. Boynton, T. J. Ahrens (Eds.), Suppl.
Journal of Geophysical Research, Vol. 88, pp. A481 - A952
(1983).



Service géologique national

V. REPORT OF THE W.G. ON LATERITES AND LATERIZATION

I. International Symposium on laterites

The second international symposium on laterites and lateritization has been held in São Paulo (Brazil) from 4th to 19th July, 1982. It has been organized simultaneously by IGCP 129 and IAGC, partly sponsored by Unesco and French Ministry of Foreign Affairs and had a great success with a participation of many countries :

- southern countries : Brazil, Upper-Volta, India, Surinam, Venezuela, Mali, Sierra Leone, Bolivia, Paraguay, etc. ; 9
- northern countries : Japan, West Germany, United Kingdom, USA, France, Netherlands, USSR, etc. 7

Besides technical meetings, the main lines of a ^{que} unified project IAGC-IGCP have been drawn up in presence of the Unesco representative and of the project IGCP 129 convenor. The principal aim would be :

"Behavior of (ore forming) elements in weathering profiles of tropical and sub tropical climates" 16 countries

The main technical topics that have been discussed during this symposium were :

- definition of laterites,
- classification of laterites and their fabric,
- geomorphologic analysis of laterites and its role in prospecting,
- lateritic bauxites,
- lateritic nickel ore,
- other lateritic ore deposits,
- geochemistry of laterite cover for concealed mineral deposits,
- palaeomagnetism of laterites,
- development of laterite standards.

The following topic has been discussed : geochemistry of Cu, Pb, Zn, Mo cycles in laterites as research of hidden accumulation sulfides of basic metals.

The comparison of the results obtained in Upper Volta (Goren) by BRGM (IAGC) and engineers from São Paulo University in "Chapada de Diamantina" (Brazil) also of our working group is very significative. These two researches have lead to a unified result : the geochemistry of alterites would allow to detect mineralizations hidden under thick lateritic cover. It is the main target of our group.

I think we are beginning to find a tool for research of those types of hidden deposits in lateritic country under tropical climate. These research programmes are going to be published in São Paulo Symposium proceedings.

II - New project

Main research subjects of the new IAGC - UNESCO group "Behavior of ore forming elements in weathering profiles of tropical and sub-tropical climates"

Geochemical studies

This study aims at reconstituting the history of the minerals and chemical elements, coming out of the mother rocks and connected with the birth of the lateritic formations. It is carried out with the help of samples taken systematically all along the most complete lateritic profiles, and described in great detail ; it is made up mainly of :

- a mineralogical and chemical study of the mother rocks ;
- a mineralogical and chemical study of the mother rocks during weathering (zone of departure) ;
- a study of the variations of the mineralogical constituents all along the profiles ;
- systematic chemical analysis.

To the study of the vertical variations of the chemical composition, will be added, when suitable, that of the migrations along slopes or inside the water-bearing strata, with an explanation of the mobilization conditions.

The chemical study will deal with the major elements (Si, Al, Fe, Mn, Ti, Ca, Na, K, Mg ... as well as the trace or infratrace elements (ppm, ppb), Cu, Pb, Zn, Ag, Mo, W, V, Ni, Cr, Co, Au ...

This global geochemical study requires at the same time detailed observations and numerous samples taken in the fields by means of wells (in preference) or core drills reaching the mother rocks, and the possibility of carrying out many chemical, geochemical, petrographic and mineralogical studies.

Research programme

The main research themes of this project will be :

- . critical documentary estimation of the existing results as well as the inventory of the available reports of the most important geological missions (s.l.) in the developing countries.

Homogenization of the nomenclature employed and meaning of the terms commonly used (thesaurus on the laterites) ;

- . choice of research zones :

the subjects liable to be studied should be chose according to miscellaneous criteria, such as the mother rocks, the climate, the morphology, the primary mineral paragenesis and the importance of the lateritic cover. We propose to select for the frist study phase six distinct targets, located in the following three tropical climate zones :

- wet tropical zone (forest),
- dry tropical zone (savanna),
- semi-desert zone (for instance, the Sahel and N.E. Brazil).

This choice will be decided upon by common agreement between the members of this joint operation according to the present preoccupations of each in this field, during meetings of the chief persons in charge.

- . Creation of a map of the different tropical weathering facies of the chosen regions to determine the weathering products and decide (after methodologic research) on the geochemical (or other) prospection methods which will make it possible to discover the metallic deposits of the bed rock, hidden by the lateritic screens.

The study will be directed towards the comparison of two profiles of autochthonous weathering, the first resting on a bed rock which contains mineralizations (sulphides Cu, Pb, Zn, for example), and the second, similar, but located close by on a sterile substratum. Measurement of the upwards and sideways mobility of the elements in the different horizons and in the different mineral (and organic) phases, must be accomplished.

Choice of the horizons in the lateritic profiles, their details, from geological, petrographical, geochemical and mineralogical points of view :

- sample-taking (choice and detailed description) ;
- mechanical preparation of the standard profiles ;
- laboratories tests :
 - . global chemistry (%) - trace (ppm) - infratrace (ppb)
 - . non destructive ponctual chemistry
 - . Mineralogy
 - . biogeochemistry
 - . physical and technological properties.

Considering the magnitude of each operation, the techniques and methods used will be carefully determined (precision, reproductibility, sensitivity, reliability ...).

Study and interpretation of the evolution of the major and trace elements in a profile :

to work out the sequence of the occurrences ; concentration of certain significant elements (V, Ni, Cr, Ti, Mn, Co, P, Li ...) or other trace elements (Nb, Ta, Ga, Pb, Zn ...) as guides to the profile's geochemical evolution, and the part played in fixing the elements during the neo-formation of certain minerals.

Simulation studies for phenomena, such as leaching, transport and precipitation, especially for the Si, The Fe and the Al.

Training and technology transfer of the developing countries administrative staff and technicians, their active participation in all the research phases including sample study by means of the most up-to-date techniques.

J. GONI 2/1/81

IAGC' Working Group "Laterites and lateritization"

Write letter re-report. (Goni)

III - Main activities in Africa

THESIS of J.P. AMBROSI (Prof. NAHON, Poitiers)

2 sections :

- study of an old toposequence with duricrust at Diouga, Upper Volta. Petrography, mineralogy and geochemistry of several sections (wells and outcrops). The initial results gave rise to a DEA, shortly to appear as a B.R.G.M. report ;

- study of an auriferous mineralization rising as far as the duricrusted horizons at Banankoro (Mali). Sampling in wells and mine workings (gallery). Work in progress.

STUDY OF THE STONE-LINE PROFILES IN GABON (GMX/GCA - in charge : P. LECOMTE)

Detailed study (mineralogy, petrography, geochemistry) of leached ferralitic profiles with stone lines. Aim - to find out more about the autochthonous or allochthonous nature of the different horizons making up this profile type. The first results show rather that the host rock is autochthonous on the whole. The problem of the stone lines and pisoliths remains open at present. Collaboration also with Poitiers on this matter.

VARIOUS STUDIES SUCH AS :

- at Goren, study of Cu and Mo dispersion over a 5 km drainage area downstream from the duricrust and mineralized zone. Cu and Mo distributions compared to the different grain-size fractions. Cu and Mo distributions between the oxide and silicate phases (selective extraction). Work accomplished, report to be written up ;

- in Mali, geochemical study of numerous wells through duricrusted lateritic formations, in different lateritic contexts ;

- in French Guiana, study of the gold distribution in ferralitic weathering profiles.

J. GOMI

Mission coopération et
développement scientifique



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IV - ACTIVITIES OF IAGC BRAZILIAN GROUP OF LATERITE DURING 1982

The most important activity of the group during 1982 was the organization of the II International Seminar on Lateritisation Processes, in co-operation with IGCP Project 129 (Lateritisation Processes). The Seminar was held In São Paulo in the period 4-12 July with the participation of 90 scientists from 20 different countries.

The Seminar consisted of three technical sessions of contributed papers and plenary lectures and three excursions being one pre-session and two post sessions. The pre-session excursion included a visit to the mineral district of Carajás with important deposits of iron, manganese, aluminum and copper; and to the ultrabasic massif of Niquelândia with the largest Brazilian lateritic nickel deposit. One post-session excursion visited deposits of aluminum and uranium in Poços de Caldas and nickel deposit in Pratápolis while the other one was concentrated in the Quadrilátero Ferrífero (Iron Quadrangle), a mineral district with the most important iron deposit in exploitation.

The Seminar proceedings, including 42 communications and 4 invited papers, are already printed and distribution will happen very soon.

...



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The laterite group of São Paulo linked to the University of São Paulo, started the study of bauxitisation of alkaline rocks in the southern region. Together with scientists from West Germany the study area will be extended to the whole Brazil.

The laterite group of Rio Grande do Sul coordinated by Dr. Formoso, finished its activity in the project: "Superficial alteration of ultrabasic rock in Rio Grande do Sul", and it is planned its participation in the bauxitisation project.

The scientists of São Paulo together with the scientists of Bahia are working in the project "Lateritic soils of the semi-arid Brazilian north-east - Equilibrium pedo-bio^{bi}climatic" and preliminary results were presented in the XX Soil Science Brazilian Congress held in Salvador. The results indicate that the lateritic soils are in equilibrium with the present bioclimatic conditions and that micro-aggregation, a peculiar characteristic of these soils, represent a process which is active now, a day.

Scientists of São Paulo, Rio de Janeiro and Paraíba keep on studying the mineralogical and geotechnical characterization of lateritic soils. It must be mentioned in particular, the interesting results, obtained by researcher of the University of São Paulo, on the study of lateritic soil stabilization by lime addition.

A. J. 

List (partial) of institutions interested in the study of laterite samples
(Regions of Goren, Upper-Volta and Bahia, Brazil)

AUSTRALIA

- . Dr. Ph. ROBINSON
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University of Tasmania
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HOBART TAS 7001
- . Dr. R.A. BINNS
Division of Mineralogy - CSIRO
Institute of Earth Resources
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NORTH RYDE, N.S.W. 2113

BRAZIL

- . Prof. A. MELFI
Instituto de Geociencias, U.S.P.
Departamento de Geologia general
Cidade universitaria - C.P. 20899
CEP 01000 SAO PAULO
- . Prof. M. FORMOSO
Instituto de Geociencias - UFRGS
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PORTO ALEGRE - R.S. Rio Grande do Sul

SPAIN

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Instituto geológico y minero de España
Rios Rosas 23
MADRID 3

FRANCE

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B.P. 6009
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45060 ORLEANS CEDEX

UPPER VOLTA

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Ministère du commerce, du développement
industriel et des mines
B.P. 601
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. Dr. György BARDOSSY

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. Dr. C.B. DISSANAYAKE

Department of Geology
University of Peradeniya

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. Ing. Konstantín RACLAVSKÝ

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. Dr. F.V. SICHORUKOV

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Siberian branch of the USSR Academy of
Sciences630 090 NOVOSIBIRSK_90

Monographies sur les latérites

- N'ZIENGUI. MAPANGOU. PACOME.

Pétrologie comparée de deux gîtes supergènes manganésifères : gisements de Ziemougoula (Côte d'Ivoire) et de Moanda (Gabon)

FRA, 30 CM, TH. 3ème CYCLE : SCI. TERRE/POITIERS/1981/797, PL./TABL./ILL./
ESQUISSE/ESQUISSE GEOL./COUPE GEOL.

1981

EN FRA ; 103 P., 26 ILL., 6 P.REF.

Les gisements de Ziemougoula en Côte d'Ivoire et de Moanda au Gabon résultent d'une concentration d'oxydes de manganèse par altération latéritique. Dans les deux cas, les transformations concernent les structures originelles de la roche-mère, à Ziemougoula, c'est la cuirasse à faciès schisteux simple, à Moanda, c'est le minerai en plaquettes d'aspect lite. Dans ce dernier cas, il n'est pas tenu compte des horizons supérieurs stériles qui sont remaniés.

- ZIAUDDIN M., KAR.P., DATTA N.R., GHOSH D.B., SANKARSA N. ROY., MISHRA K.C.,
CHAKRAVARTY D.C., MURTHY K.K., MALLICK B.B.

Nickel mineralisation in the Sukinda ultramafic field, Cuttack district, Orissa.

BULL. GEOL. SURV. INDIA, SER.A., IND., BRGM-IND 11, TABL./COUPE GEOL./
ESQUISSE

1979, NUM. 43

EN ANG : 516 P., 24 ILL., 21 H.T., 1 P.REF.

- MAQUET Michel

Contribution à la cristallogénèse des serpentines Fe-Ni, par spectrométrie visible et I.R. proche. Extension aux minerais néocalédoniens.

FRA., 30 CM, TH. 3ème CYCLE : SCI. NAT./PARIS 6/1981, ILL.

1981

EN FRA : 87 P., 8 P. REF.

Les minéraux serpentiniteux nickélicifères et des minerais saprolitiques de Nouvelle-Calédonie, peuvent apporter des données sur la cristallogénèse du nickel et aider à comprendre ses mécanismes de déplacement et de concentration.



International Association of Geochemistry and Cosmochemistry

August 15, 1983

Moscow

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VI - REPORT OF THE ACTIVITY OF THE W.G. ON THERMODYNAMICS OF NATURAL PROCESSES OF THE IAGC FOR 1982-1983

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TOKYO, JAPAN, AUGUST 27 - 28, 1983
(submitted at IAGC Council Meeting).

Secretary

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1. Introduction.

At the Council Meeting IAGC in Irkutsk, USSR (September, 1981) a new working group called "Thermodynamics of Natural Processes" (TNP) was set up under the chairmanship of Professor Igor L. Khodakovsky (Vernadsky Institute of Geochemistry and Analytical Chemistry, Academy of Sciences, USSR, Moscow).

WG-TNP IAGC has the following (aims?)

- computer-based development of the International Tables of Thermodynamic Properties of Minerals and Mineral-forming Substances and the determination of the list of substances for which experimental investigations are needed;
- periodical information on the current and perspective experimental and theoretical investigations in the field in question;
- organization of International Symposia and schools on the application of thermodynamics in geochemistry and cosmochemistry.

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2. Meetings WG-TNP.

As the result of intensive correspondence and personal meetings of WG-TNP members during 1982-1983 the problems of the organization, structure and activities WG-TNP have been solved.

Prof. I. L. Khodakovsky during his visit to Tokyo to attend the International Symposium on Hydrothermal Reactions, March 1982, discussed with Dr. R. O. Fournier (USA), Dr. T. M. Seward (New Zealand), Prof. H. Sakai (Japan), Dr. J. Franz (USA) the future plans of WG-TNP.

On October 22, 1982 there was a meeting in Moscow where the following members TNP took part: Prof. Y. Tardy (France), Prof. I. L. Khodakovsky, Prof. I. D. Ryabchikov and Dr. V. A. Dorofeyeva.

During his visit to USA in connection with the 14th Lunar and Planetary Science Conference in Houston, March 16-27, 1983, Prof. Igor L. Khodakovsky Chairman WG-TNP, met his American colleagues, TNP members: Prof. John L. Haas (Geol. Survey, Reston, USA), Dr. Bert R. Staples (NBS, Washington) and Dr. Bruce Fegley (MIT, Cambridge). Unfortunately, due to certain circumstances all the members could not gather in one place. Therefore, three bilateral meetings were held: Prof. I. L. Khodakovsky - with Dr. B. Fegley in Houston, March 17 the same - with Prof. J. L. Haas at Stony Brook, March 22 and with Dr. B. Staples at Cambridge, March 26. For these meetings Igor L. Khodakovsky prepared the materials based on the proposals put forward in his letter of October 6, 1982 and in the letters of Prof. R. M. Garrels, Prof. Y. Tardy, Prof. J. Haas, Dr. B. Fegley and also the proposals made by I. D. Ryabchikov, Prof. V. S. Urusov and Dr. V. A. Dorofeyeva. The preliminary exchange of opinions by correspondence promoted the understanding between all TNP members and coming to an agreement of each question concerned.

3. Scientific and administrative structure WG-TNP.

Honorary Chairman, Chairman WG-TNP, Vice-Chairman WG-TNP, Sub-Group Chairmen and Secretary WG-TNP are likely to set up the apex-body of the Working Group.

All TNP members have unanimously agreed to elect Prof. Robert M. Garrels (USA) Honorary Chairman of the Working Group on Thermodynamics of Natural Processes, taking into account his great contribution to the popularization of thermodynamic knowledge among geologists. Prof. John L. Haas (USA) was elected Vice-Chairman.

Furthermore, for better exchange of information with the scientists from different countries it seems desirable to include in WG the national representatives, one - from each country. It would be more helpful if this responsibility could be taken over by the leading scientists of these countries, those at the head of national schools of thermodynamics, working in the field of geochemistry. It would substantially facilitate the exchange of information for Sub-Group Chairmen and the organization of various conferences.

The national representatives should send as soon as possible the mailing lists of scientists of respective countries working in the field of thermodynamics of natural processes indicating the particular field of their interests (according to the list of sub-group titles) to Chairman WG-TNP, Prof. I. L. Khodakovsky. Mailing list of members WG-TNP are attached in the appendix. USSR

Practically all the members agreed that the scientific work should mostly be done by Sub-Groups. Brian Hitchon (Canada), Chairman, Interest Group On Water)Rock Interaction IAGC, concurred that WRI Interest Groups 6, 7 and 8 (Experimental water-rock reactions, low to moderate temperatures and pressures; Thermodynamic and computer approaches to fluid composition; and Reaction rates and kinetics, respectively) overlapped TNP Working Group in their interests. Accordingly, it was agreed to transfer Interest Groups 6, 7, 8 from WRI to TNP.

WG - TNP

The majority of members think that the tasks of the three sub-groups, transferred from WRI to TNP should conform rather to TNP goals than to those of WRI. There are grave doubts about the expediency of the preservation of WRI sub-groups within TNP and about the renaming of sub-group "Reaction rates and kinetics" into "Thermodynamics of non-equilibrium natural processes". Working Group of Kinetics of natural processes (KNP) could be structurally separated from TNP only in future since at present this trend has only started its development. At present it is useful to preserve within TNP sub-group "Thermodynamics of non-equilibrium natural processes".

As a result of the discussions on the number and titles of sub-groups it was decided to organize the following sub-groups:

1. Thermodynamic properties of key minerals. Chairman: J. L. Haas (USA).
2. Thermodynamics of mineral solid solutions. Chairman: V. S. Urusov (USSR)
3. Thermodynamic properties of natural aqueous solutions at low

temperatures. Chairman: B. Staples (USA).

4. Thermodynamics of reactions of isotopic exchange. Chairman: H. Sakai (Japan)
5. Estimations of thermodynamic properties of minerals. Chairman: Y. Turdy (France)
6. Correlation techniques and computer simulation of natural processes. Chairman: B. Frity (France)
7. Thermodynamics in Cosmochemistry. Chairman: B. Fegley (USA)
8. Thermodynamics of mantle minerals. Chairman: V. H. Zharkov (USSR)
9. Thermodynamics of magmatic processes. Chairman: T. D. Rjabchikov (USSR)
10. Thermodynamics of metamorphic processes. Chairman: ? (Greenwood)
11. Thermodynamics of hydrothermal ore-deposit processes. Chairman: T. M. Seward (New Zealand)
12. Thermodynamics of non-equilibrium natural processes. Chairman: T. Paces (Czechoslovakia)

It was suggested that Prof. I. L. Khodakovsky should propose to Prof. H. T. Greenwood (Canada) that he become Chairman of sub-group 10.

The sub-groups could consist of 4-10 specialists who coordinate the work by meetings and correspondence. Members of sub-groups are scientists well-known in their own field who give their time freely to TNP activities.

4. Periodical information on WG-TNP.

Chairman TNP will send round the official information (minutes of WG-TNP meetings, letters of information, etc.) to all Sub-Group Chairmen and National representatives of WG-TNP. The National representatives should distribute this information among scientists of their countries.

It seems that the annual publication of references of all experimental and theoretical works in the field of thermodynamics of natural processes is needed. However, at present, the way of technical solution of this problem is unclear, as well as the question of the creation of WG-TNP bibliographic center.

5. Relations between WG-TNP and CODATA, IUPAC, IAPS.

The coordination between WG-TNP IAGC and CODATA, IUPAC and IAPS is necessary. It could be realized not only by means of information exchange but also by direct participation of TNP members in working groups of these international organizations and conferences sponsored by IUPAC, CODATA and IAPS. In particular, it could be suggested

to the IUPAC, CODATA and IAGC leaders that one of its conferences in future (1985-1986) should be devoted to the themes common for both organizations.

Prof. I. L. Khodakovsky, WG-TNP Chairman, applied at the end of 1982 to Dr. W. W. Hutchison, President CODATA and Prof. R. Sinding-Larsen, Chairman Advisory Geoscience Committee, CODATA, with a proposal to organize within CODATA a Working Group "Geothermodynamics" the task of which could be the recommendations of key values for "International Tables of Thermodynamic Properties of Minerals and Mineral-forming Substances" on the basis of computer. In August 1983, Dr. W. W. Hutchison informed Prof. I. L. Khodakovsky of his agreement to this proposal. At present this question is being discussed with Prof. R. Sinding-Larsen. This international project is planned to be sponsored by both CODATA and IAGC.

6. International Symposia and schools WG-TNP.

WG-TNP in cooperation with the International Commission on Experimental Petrology at High Temperatures and Pressures, (IUGC) takes part in the organization of International Symposium "Thermodynamics of mineral formation" to be held within the framework of the 27th International Geological Congress in Moscow, 4-14 August, 1984. Chairmen: J. L. Hure (USA), I. L. Khodakovsky (USSR), I. Tardy (France), V. A. Zharikov (USSR).

The following topics have been selected for discussion:

- a) Thermodynamics of hydrothermal mineral formation;
- b) Thermodynamics of mantle minerals;
- c) Thermodynamic models of magmatic and ore-forming systems.

Prof. I. L. Khodakovsky applied to Prof. V. L. Barsukov, President IAGC, with a request that IAGC charge WG-TNP with the responsibility of participating in the organization of the Second International Symposium on Hydrothermal Reactions in USA, Pennsylvania, 1985 (Chairmen: Prof. Robert L. Barnes and Prof. Arnold Gunn) and provide for WG-TNP members the financial support for attending this Symposium. The decision on this question will be taken at the meeting of IAGC Council in Tokyo, August 27-28, 1983. *what was it?*

The First International Symposium on Thermodynamics of Natural Processes, sponsored by our group, is being planned to be held in France, Strasbourg. Prof. Y. Tardy has already given the

preliminary consent to organize this Symposium in 1988.

7. Proposals on the compilation and the recommendations of thermodynamic data.

All WG-TNP members have agreed that the work of WG should not be confined only to the organization of some meetings and exchange of bibliographies, etc. The important part of WG-TNP work should be the computer-based development of the International Tables of Thermodynamic Properties of Minerals and Mineral-forming Substances and also the also the determination of the list of substances for which the experimental investigations are needed. This work should be coordinated with international projects of CODATA, IUPAC and IAPS. Every Sub-Group Chairman is to submit the list of substances for which primarily the reliable values of thermodynamic properties are necessary, the list of thermodynamic properties, and to outline the program of the preparation of the tables of recommended values.

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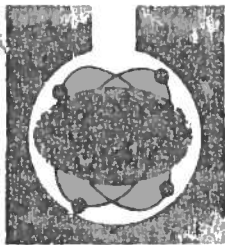
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