INTERNATIONAL ASSOCIATION OF GEOCHEMISTRY AND COSMOCHEMISTRY

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IAGC NEWSLETTER - NO. 2, JUNE 1972

IAGC WORKING GROUPS AND COMMISSIONS

At the time IAGC was organized, it was felt that much scientific progress could be achieved by establishing a number of working groups and commissions. This issue of the IAGC NEWSLETTER contains information about some of the activities of some of the groups and commissions. At present, two commissions and five working groups have been organized. The active commissions and groups, along with their chairmen, are given below:

Commissions

1. Extraterrestrial Chemistry and Meteorites - Chairman, Prof. A. G. W. Cameron, Yeshiva Univ., New York, N. Y. 10033, USA.

2. Organic Geochemistry- Chairman, Dr. K. A. Kvenvolden, Natl. Aeronautics & Space Administration, Moffett Field, California 94035, USA.

Working Groups

1. Geochemistry of Sediments - Chairman, Prof. A. B. Ronov, Inst. of Geochemistry, Vorob'evskoe shosse 47a, Moscow V-334, USSR.

2. Isotope Geochemistry - Chairman, Prof. M. Fornaseri, Inst. de Geochemica, Univ. Roma, Italy.

3. Geochemical Prospecting - Chairman, L. V. Tauson, Inst. of Geochemistry, 33-Irkutsk, USSR.

4. Geochemistry of Health and Disease - Chairman, Dr. E. J. Underwood, Western Australian Labs, CSIRO, Private Bag, P. O. Wembly, Western Australia 6014.

5. Hydrogeochemistry - Chairman, Prof. M. G. Valyashko, Lomonosov State Univ., Moscow V-234, USSR. (Because of the wide scope of its subject, the functions of this group have been distributed among five subgroups, the chairmen of which are listed under the section covering the activities of this Working Group.)

Current and potential members of IAGC who are actively interested in the fields of any of the Working Groups or Commissions and would like to have a part in the work should write to the appropriate chairman, giving personal background details, particular areas of competence, along with any ideas as to what activities the group might follow. Most groups still have room for additional members who are genuinely concerned and wish to be active.

Commission on Extraterrestrial Chemistry and Meteorites

This Commission is a direct outgrowth of the 1967 Paris IAGC symposium on the Origin and Distribution of the Elements. The symposium provided an opportunity for a meeting of the Council of IAGC. Among Council actions was the establishment of the Commission, Dr. A. G. W. Cameron (USA) being appointed chairman. The main purpose of the Commission is to stimulate cooperative international activities in the main disciplines related to extraterrestrial chemistry.

One of the Commission's major projects has just been completed, the compiling of the Handbook of Elemental Abundances in Meteorites, edited by Dr. Brian Mason (see attached announcement). The next major project is the arranging of a Symposium on Cosmochemistry for August 1972 (see announcement below). The symposium will contain invited papers, contributed papers, and rapporteur talks. Inasmuch as IAGC through its Commission on Extraterrestrial Chemistry and Meteorites, is the only international organization bringing together interested scientists for interdisciplinary action, funds are being sought from UNESCO to defray travel expenses for scientists attending the forthcoming symposium.

Commission on Organic Geochemistry

The Organic Geochemistry Commission was formally organized in January, 1971. The group is distinct from the Organic Geochemistry Division of the Geochemical Society, but it has ties with the Division through members who serve with both groups. The present membership comprises: G. Eglinton (UK), F. Gassarriri (Italy) B. Jones (Australia), K. A. Kvenvolden, Chairman (USA), S. M. Mankaysa (USSR), R. D. McIver, Vice-Chairman (USA), D. W. Spenser (USA), K. Taguchi (Japan), B. Tisset (France), and D. Welte (Germany).

Some question remains as to the advisability of the Commission participating in UNESCO's Man in the Biosphere program. Most members favor participation; however, Dr. Manskara feels the Commission should remain independent of the UNESCO effort. Four members (Eglinton, Kvenvolden, Tisset, and Welte) met at the 1971 International Meeting on Organic Geochemistry in Hanover. These four began planning for an international symposium on Man's Influence on the Carbon Cycle.

Isotope Geochemistry Working Group

Shortly after its formation as a Working Group, Prof. Fornaseri received an invitation from UNESCO to consider participation by IAGC in the International Geological Correlation Program (IGCP). Three phases of IGCP to which the Isotope Geochemistry Working Group might contribute are: (1) application and evaluation of time correlation methods, (2) patterns in time and space of plutonic, climatic, and biologic events, (3) genesis of ore deposits in relation to earth history. In order to make any IAGC contribution effective, Prof. Fornaseri feels that emphasis should be on further study of regularity of isotopic composition and stimulation of projects in which international cooperation is involved.

The Working Group held a formal meeting in September, 1970 in Tokyo. In addition to the Chairman, the following were present: Drs. Aswathanarayana (India), Clayton (USA), Kaplan (USA), Lal (India) Oana (Japan), Rafter (New Zealand), and Sakanoue (Japan). Considerable divergence of opinion was expressed at the meeting. One opinion favored dissolving the group because isotope studies are such an integral part of all geologic studies that a separate group is unwarranted. Most

participants, however, felt that such a group could serve a vital purpose in clarifying technical problems in isotope work, in aiding developing countries in starting isotope programs, in stimulating interest in different isotope techniques, and in holding international cooperative symposia. The meeting ended with Professor Fornaseri indicating that he would pursue the subject of the scope and program to be followed by the Working Group.

Geochemical Prospecting Working Group

The membership of this Working Groups comprises: Drs. Beus (USSR), Bloom (USA), Choubert (France), Friedrich (DBR), Garrett (Canada), Goni (France), Grigoryan (USSR), Hawkes (USA), Shmakin, Secretary (USSR), Solovov (USSR), Tauson, Chairman (USSR), Tooms (UK), Trudinger (Australia), and Warren (Canada). The Working Group met in Toronto in April 1970 at the Third International Symposium on Applied Geochemistry.

Professor Tauson suggested that the Working Group's efforts be directed toward the problem of prospecting for deep-seated ores using geologic and geophysical, as well as geochemical, techniques. He feels that specific attention might be directed to: (1) the geochemical history of trace elements in deep faults, (2) the relation between geochemistry and intrusions and their ore-producing potential, (3) primary zoning as a guide to ore, and (4) secondary halos related to ore distribution. In addition, better means of handling masses of geochemical data, e. g., by computer, need study. Finally, he feels that certain elements which are not commonly considered as guides to ore need study. These include Hg, I, F, B, plus some of the alkali and alkaline earth elements.

The group has not yet decided how to bring new findings to the attention of the scientific community. Professor Tauson suggests: (1) regional seminars on geochemical prospecting, mainly for the benefit of developing countires, (2) symposia, (3) publication of monographs, and (4) consultation with geologists from different countries. Success for the program depends to a great extent on outside financing, which Professor Tauson hopes may come from organizations such as UNESCO and UNDP.

Geochemistry of Health and Disease Working Group

The Chairman, Dr. Underwood, was invited to attend the workshop on Factors affecting Uptake of Trace Elements by Plants. This workshop, sponsored by the newly formed Society of Environmental Geochemistry of Health and Disease, was held in Februar 1972 in California, USA. It should be possible to complete the organization of the Working Group after his return to Australia.

Hydrogeochemistry Working Group

This Working Group held its first meeting in September, 1970 at the Tokyo Symposium on Hydrogeochemistry and Biochemistry. Professor Valyashko, the Chairman, suggested that the Working Group could operate best through five subgroups. These, and their chairmen are:

1. Unpolluted Water - Chairman to be selected

2. Methods, Standards, and Interlaboratory Calibration - Chairman, Dr. A. J. Ellis, Dept. of Scientific and Industrial Research, Petone, New Zealand.

3. Interstitial Waters - Chairman, Dr. P. A. Krukov, Institute of Inorganic Chemistry, Novosibirsk, USSR.

4. Interaction of Water and Rocks Under Natural Conditions - Chairman, Dr. D. E. White, U. S. Geological Survey, Menlo Park, California, USA.

5. Interaction of Water and Living Matter - Chairman, Professor G. G. Polikarpov, Institute of Biology of South Seas, 2 Nahimov Street, Sevastopol, USSR. Secretary, Dr. L. I. Rozhanskaya, same address as for Professor Polikarpov.

Dr. Ellis has suggested that his subgroup can be most effective by stimulating international concern over quality of water analyses by improving reporting, by exchange of standard samples, and by demonstrating to laboratories the uses to which quality waters, he feels that his subgroup should concentrate on terrestrial waters. Dr. D. E. White is now gathering personnel for his subgroup. He feels that emphasis should be on the interaction of rocks and hydrothermal waters. Also, studies should be directed to rock-water interactions in "active" sedimentary and metamorphic environments, e.g., in modern, deep sedimentary basins. As a result of polling a number of scientists, Professor Polikarpov has proposed a most comprehensive research program for his subgroup. It includes: (1) structure of water and its solutions, (2) influence of biota on aquatic environments, (3) aquatic influence on elemental exchange between environments and biota, and (4) interaction of biota with man-influenced chemical factors in water.

At a meeting in Moscow (July, 1971) the Working group supported Dr. Ken Sugawara's suggestion for a symposium on Hydrogeochemical Methods and their Applications. No details have yet been formulated, but the Working Group feels that the symposium should be held no later than 1974.

FIRST INTERNATIONAL GEOCHEMICAL CONGRESS - MOSCOW, 1971

The First International Geochemical Congress (sponsored by UNESCO, Akademiya Nauk USSR, and IAGC) was held in Moscow 20-25 July 1971. The total attendance, including accompanying personnel and visitors was estimated to be 1500. According to the records of the Secretary of the organizing Committee, 1073 participants registered; 903 of these (84%) were from the USSR, 99 (9%) from other socialist countries, and 71 (7%) were from all other countries.

The 207 papers listed for presentations were distributed as follows: 140 (68%) from the USSR, 17 (8%) from other socialist countries, and 50 (24%) were from all other countries. Unfortunately these figures do not reflect accurately the papers actually presented because of a significant number of last-minute deletions and additions. Most of the deletions appear to have resulted from an unfortunate misunderstanding about the conditions of applying for visas, which prevented many potential participants from applying for visas in time to obtain them before the meeting. The same factor undoubtedly reduce the attendance from abroad and made actual attendance of participants lower than the reported registration. For example, the report showed 15 registered from the USA, but only nine persons actually attended.

The general theme of the Congress was the Geochemistry of Geologic Processes. The following four sessions were held: (1) Magmatic Processes - 59 papers, (2) Hydrothermal Processes - 53 papers, (3) Metasomatic and Metamorphic Processes - 44 papers, and (4) Sedimentary Processes - 56 papers. Again, these figures were taken from the program that was printed in advance and they really do not reflect exactly the numbers of papers actually presented in each session.

Abstracts of the papers have been published in English in two volumes totalling 1023 pages. A complete author index is in the second volume. Requests

for copies should be addressed to the editor, Professor A. I. Tugarinov, Vernadsky Institute of Geochemistry, Vorob's evskoe shosse 47a, Moscow V-334, USSR.

The complete proceedings of the Congress will undoubtedly be published in Russian, but publication data and other details have not yet been announced. An English version of the proceedings will probably not be published because a majority of the papers are in Russian and there appears to be no practical way of having them translated and edited for publication. About 20 or so selected papers may be published in Chemical Geology. The selected papers, however, would not be broadly representative of those given at the Congress because about two-thirds of those to appear in Chemical Geology are from North America, whereas most of the others are from the USSR.

Only two voting members of the IAGC Council were present at the Congress, Professors K. Sugawara and I. Tugarinov. It was impossible, therefore, to schedule meetings for either the council or for the Executive Committee.

The Working Group on Hydrogeochemistry held a meeting at the Congress and recommended that IAGC sponsor a symposium on Hydrogeochemical Methods and their Applications to be held in Canada or USA no later than 1974.

The International Union of Geodesy and Geophysics also met in Moscow (in August 1971). At a meeting of their International Association of Hydrologic Sciences (3 August 1971) it was suggested that IAHS might co-sponsor and cooperate in organizing the above mentioned hydrogeochemistry symposium. The participants at the meeting supported this proposal and suggested that a second topic be added, i.e., Geochemical Studies of Hot and Superheated Ground Water. No formal proposal for holding such a symposium has yet come to the Council of IAGC, hence no action about sponsorship, location, or timing has been taken.

SYMPOSIUM ON COSMOCHEMISTRY

IAGC will hold a Symposium on Cosmochemistry on 14-18 August 1972 at Cambridge, Massachusetts, USA. The local hosts will be the Smithsonian Astrophysical Observatory and the Harvard College Observatory.

The symposium will contain invited papers, contributed papers, and rapporteur talks. The invited talks are being concentrated as "mini-symposia" during the mornings of the meeting week. The contributed papers will be given in parallel sessions on the afternoon of Monday through Thursday of the week. On the Friday afternoon there will be rapporteur talks giving the highlights of the contributed paper sessions, together with possible round-table discussions and general discussion. A tentative list of the invited talks is given below.

Contributed papers on any of the topics relevant to the symposium will be welcome. Abstracts not exceeding one page in length (single-spaced) should be sent no later than 1 June 1972 to Dr. A. G. W. Cameron, Yeshiva University, 2495 Amsterdam Avenue, New York 10033, USA. Further information about the symposium can be obtained from Dr. Cameron.

Invited Papers

Date	Topic	Speaker
Aug. 14	Stellar and Solar Abundance	Pagel*
	Nucleosynthesis	Truran
	Cosmochronology	Schramm*

Aug. 15	Interstellar Grains	Greenberg
	Interstellar Molecules	Klemperer
	Composition of Cosmic Rays	Price
Aug. 16	Composition of Solar Wind	Hundhausen
	Gas in Meteorites and Lunar Material	Geiss*
	Composition of Planetary Atmospheres	Lewis
Aug. 17	Structure and Composition of Terrestrial Planets	Anderson
	The Moon as a Planet	Gast
	The Giant Planets	Hubbard
Aug. 18	Comets and Interplanetary Dust	Delsemme
	Chemistry of the Solar Nebula	Larimer
	Evolutionary Processes in Meteorites	to be selected

* tentative acceptance

ACTIVATION ANALYSIS

In the first issue of the IAGC NEWSLETTER mention was made of the advanced study institute on "Activation Analysis in Geochemistry and Cosmochemistry" which was held in September 1970 in Kjeller, Norway. The proceedings have been published and can be ordered from Universitetsforlager, Blindern, Oslo 3, Norway. A review of the book is given below.

BOOK REVIEWS

ACTIVATION ANALYSIS IN GEOCHEMISTRY AND COSMOCHEMISTRY, edited by Arild Brunfelt amd Eiliv Steinnes (1971), Universitetsforlaget, Blindern, Oslo 3, Norway. Review by: Dr. W. A. Hoyer, Esso Production Research Co., P. O. Box 2189, Houston, Texas 77001, USA.

This book might be more properly titled the Proceedings of the NATO-sponsored conference on the subject matter. This conference was held in Spetember, 1970, and the papers give a state-of-the-art as of that time. Like most fertile fields, activity in activation analysis produces information so rapidly that meetings such as this one are quite productive. The conference also demonstrates that activation analysis is no longer just a laboratory curiosity, but has matured sufficiently to find accepted roles in areas of geochemical analysis for rare earth, noble metal, and trace elements.

Two types of papers are presented: (1) those dealing with advances in activation technology including data reduction, and (2) those dealing with the results of analysis having geochemical interest. In the first category, the subject matter ranges from fast and epithermal neutron analysis to Bremsstrahlen and proton irradiation. Also, four papers covering computer data reduction provide an excellent review, and present accounts by authors of their experience in calculating peaks, finding peaks in large background, data smoothing, and techniques of handling both NaI and solid state spectra. The paper by Yule gives an excellent account of the development of computer data reduction including those methods which did not work.

There are two papers in a practical vein; one includes the determination of copper in cores using a 124 Sb/Be neutron source and the other on the determination of gold in geologic materials. These two contributions, and possibly one or two others, would be of interest to those concerned with commercial application of analysis for specific purposes.

The geochemical implications running through many of the remaining papers have bearing on the analysis of lunar samples. In many cases, elemental abundance trends provide a basis for describing potential sources for the moon samples. In fact, this collection of articles offers a good resume of the geochemical features of lunar samples, as given in the article by Haskin et al, Rare-earths in Meteoritic Terrestrial and Lunar Matter or in the Baedecker paper, Chemical Evidence Relating to the Origin of Returned Lunar Material. Another interesting survey by Kiesl, "On the Determination of Trace Elements in Meteoritic Phases by Neutron Activation Analysis, provides a geochemical insight into the evolutionary history of the meteorites.

The proceedings of this conference are contributions by many respected workers. The volume lacks an index and often specific information must be inferred by the titles of the various articles. This book is recommended to anyone doing activation analysis and in particular to those specifically concerned with geochemical, geological, cosmochemical, or mineral applications.

SOURCEBOOK FOR PETROLEUM GEOLOGY, compiled by Robt. H. Dott, Sr. and Merril J. Reynolds, 1969, Amer. Association Petroleum Geologists, Memoir 5, 471 p., $18.00 (25% discount, AAPG members). Review by: Professor G. Briggs, Department of Geology, Univ. of Tennessee, Knoxville, Tennessee, USA.

This is one of three books authorized by AAPG to commemorate the Association's semicentenial. The writers provide a history of man's ideas on the origin, migration, and entrapment of petroleum by tracing the development of such ideas through the compiling of quotations from the literature. One would expect such a presentation to be dull, but the manner in which the development of man's thinking has been synthesized makes the book extremely readable and informative.

The volume is divided into two parts. Part I. Genesis of Petroleum, is compile by Dott. It traces the development of ideas about the origin of petroleum from the early hypotheses of an inorganic genesis, such as the volcanic origin of Humbolt (1804) and the cosmic origin of Sokolov (1890), to hypotheses of an organic origin proposed as early as the sixteenth century and prevailing to the present. Source beds, primary migration, and the maturation and chemical alterations of petroleum are similarly treated. A glossary by E. W. Biederman provides easy reference for chemical terms used in Part I. Part II, Secondary Migration and Accumulation of Petroleum, is compiled by Dott and Reynolds. Proceeding with the same continuity exhibited in Part I, the writer review the ideas, both pro and con, concerning the movement of petroluem within the reservoir, the properties of reservoir rocks, and the means by which petroleum becomes trapped. Parts I and II are followed by extensive bibliographies.

Although designed primarily for use as a reference, the in-depth research and its outstanding organization, continuity, and readability make this book equally valuable as a textbook or as a book for pleasurable reading.

THE HANDBOOK OF ELEMENTAL ABUNDANCES IN METEORITES, edited by Brian Mason, 1971, Gordon and Breach, New York, $13.90 for IAGC members (Vol. 1 of "Series on Extra-terrestrial Chemistry"). Review by: Dr. Robert A. Weeks, Senior Physicist, Solid State Physics Division, Oak Ridge National Laboratory (Union Carbide Corp.), Tennessee.

Perhaps the first evidence for a non-uniform distribution of elements in the solar system was obtained from a calculation of planetary masses. Geologists have since chown that those elements with greatest natural abundance must have a non-uniform distribution in Earth. In recent years it has been suggested that some type of meteorites, chondrites, may have elements present in avundances which, in some way is characteristic of their abundances in the primordial condensate from which proto-planet

and then planets were formed. The evidence supporting these suggestions, which has been developed by intensive study of meteorites, is distributed through the pages of many journals. This volume, with contributions from 21 authors, is a collection of a large quantity of data organized in the most simple fashion. For the most part, each element is considered separately and in an atomic number sequence. Some elements, e. g., the lanthanides, are presented as a group, for obvious reasons.

The individual authors have selected what they think is the best available data for each element. Usually the basis for their selection is presented with a short discussion of the data. As a result, considerable repetition does show up. Most of the authors have adhered to the Van Schmus and Wood classification scheme for chondrites, thereby providing a consistent framework for the data on this class of meteorites. In this scheme the most abundant group is L6 with 152 members. For this group the data should have a greater statistical significance than for some of the other groups for which there are ten or fewer members. But for many elements this statistical significance is not possible, since the number of samples in this group which have been analyzed for a particular element may be less than ten. The significance of the elemental abundance in those meteorites which are unique is difficult to determine, and until additional falls are observed and recovered these evaluations must be held in abeyance.

This volume, presumably the first in a series on extra-terrestrial chemistry, will be a useful addition to the library of meteorists and possibly to selenologists. Those libraries which serve people who have interests in solar system processes will wish to add it to their collection.

SYMPOSIUM ON HYDROGEOCHEMISTRY AND BIOGEOCHEMISTRY

The proceedings of the symposium, which was organized by IAGC and the Science Council of Japan, have now been published (see enclosed announcement) by the Clarke Co., 1054 31st St. NW, Washington, D. C. 20007, USA. Although the pre-publication reduced price of $10.00/volume expires July 15, 1972, IAGC members may continue to purchase the volumes at the reduced rate even after July 15, 1972.

CHANGE OF ADDRESS

For future mailings of the IAGC NEWSLETTER, notify the Associate Secretary of IAGC of any address change or of any correction to be made for your present address label.