The Geochemical News

NUMBER 24 October 1960

GEOCHEMISTRY AT HELSINKI AND COPENHAGEN

At the XII General Assembly of the International Union of Geodesy and Geophysics, Helsinki, July 25-August 5, 1960, in addition to sessions consisting of regularly contributed papers on geochemistry and symposia on Atmospheric Chemistry, Chemical Oceanography and Volcanic Gases, there were three specially organized symposia in geochemistry: (1) Isotope Geology, (2) Experimental and Theoretical Petrology, and (3) Age Determinations. All of these sessions were well attended and the discussions were lively and interesting. At least most of the papers will be published in the transactions and other publications of the respective Associations.

The President of I. U. G. G., Dr. J. Tuzo Wilson, had called for a general discussion on the Role of Geochemistry in International Scientific Meetings. Two such sessions were held and many possibilities for international organization and cooperation were discussed. Action taken was appointment of an ad hoc Union committee to (1) supervise geochemical matters in the Union during the next triennium and (2) serve as a liaison group with other groups interested in geochemistry, especially at the Copenhagen meeting of the International Geological Congress, August 15-25, 1960.

At Copenhagen the committee met with a similar group appointed by Dr. Arne Neo-Nygaard, President of I. G. C., and previously appointed representatives of the Geochemical Commission and the Geochemical Society. At this meeting a coordinating Committee, drawn largely from membership of the other groups, was appointed: Correns, Epstein, Ingerson (Secretary), Krauskopf (Chairman), Picciotto, Roubault, Sugawara, Vinogradov, Wager and Wilson. It was suggested that this committee might become affiliated with the International Union of Scientific Unions and serve as the inter-union agency for co-ordinating and helping to plan and hold geochemical meetings with, or by, any interested international group. Information on national and local geochemical meetings should also go to this committee so that they can serve more effectively as the clearing house for information on such meetings.

In Copenhagen there were also two geochemical symposia, in addition to the sessions of contributed papers on geochemistry: (1) Geochemical Standards, sponsored by the Geochemical Society, and (2) The Geochemistry of Sedimentary Carbonate Rocks, sponsored by the Geochemical Commission. The proceedings of these symposia will appear as a special symposium issue of Geochimica et Cosmochimica Acta.

Earl Ingerson

GEOCHEMISTRY IN THE COPENHAGEN PROGRAM

At the meetings of the International Geological Congress in Copenhagen, there were two sections that dealt principally with geochemistry. Section 1, entitled Geochemical Cycles, met in three sessions during which a total of 19 papers on various aspects of geochemistry was presented. Section 2, The Geological Results of Applied Geochemistry and Geophysics, also met in three sessions, the first two of which were devoted primarily to geochemical results and involved a total of ten papers. The last of these three sessions presented geophysical results. In addition, the symposium sponsored jointly by the Geochemical Society and the Geochemical Commission of the IUPAC (Chemical Institute) on the geochemistry of sedimentary carbonate rocks included a total of six papers.

All sessions were exceedingly well-attended and most of the papers were followed by considerable pertinent discussion. An additional gratifying aspect of the meetings of this XXI Geological Congress was that all papers presented were availabe in published form prior to their presentation. The proceedings of section 1 on Geochemical Cycles has appeared as Part 1 of the report of the XXI session and the proceedings of section 2 on the Geological Results of Applied Geochemistry and Geophysics has been published as Part 2. These two volumes aggregate a total of 363 pages.

SYMPOSIUM ON STANDARDS

The Symposium entitled "The Need for Standard or Reference Samples for Correlating Geochemical Data" was held in Copenhagen, Denmark, on August 17, 1960, in conjunction with the International Geological Congress. The Symposium was sponsored by the Geochemical Commission of the UPAC and the Geochemical Society. Over one hundred representatives from various parts of the world attended the meeting.

The objective of the symposium was to review available standards that geochemists can obtain and to determine geochemists' needs. The Chairman of the Symposium, A. Van Valkenburg, gave a brief review of available standards in the United States and other countries and he concluded that standards are practically nonexistent. Michael Fleischer then gave a talk on the usefulness of G-1 and W-1 as reference standards. He described the reasons for selecting these rocks, the methods of preparation, and, finally, the analytical results obtained from laboratories all over the world. The latest results have recently been published in the United States Geological Survey's Bulletin 1113 entitled "Second Report on a Cooperative Investigation of the Composition of Two Silicate Rocks". This Bulletin may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D.C., at a cost of 40 cents.

Following Fleischer's talk there was a general discussion by the representatives of what standards are needed by geochemists. The list included a standard meteorite sample, various types of rock samples, single crystal standards, and standards pertaining to natural occurring organic compounds. The Chairman pointed out that the Standards Committee of the Geochemical Society has under way the preparation of a dolomite and a granite rock similar to G-1 as reference standards. The Non Metallic Standards Committee of the Canadian Association for Applied Spectroscopy also has a standards program under way. At present two rock samples are being analyzed by various laboratories. These are a sulphide ore and a syenite rock. Anyone who would be interested in this program should contact Dr. G.R. Webber at McGill University. The Geological Survey of Tanganyika is now actively engaged in the preparation of a rock standard known as T-1. This rock is a late-orogenic Archean tonalite. Chemically the rock is ideal as a standard, for it lies roughly midway between G-1 and W-1. Those who are interested in this rock and are willing to cooperate in its standardization should contact The Commissioner for Geological Survey, P.O. Box 69, Dodoma, Tanganyika.

Many letters were received from those who could not attend the Symposium, expressing their ideas on standards and the organization of an international group for the exchange of samples and data. Several laboratories have offered to participate in the analysis of materials and the Standards Committee appreciates these offers.

A summary of the information received at the Symposium and from letters will be published in the near future, possibly in the Geochemica et Cosmochimica Acta. Those who are interested will receive reprints. The Standards Committee wishes to thank all those who participated in the Symposium and those who wrote in suggestions.

A. Van Valkenburg
Chairman of the Standards Committee
The Geochemical Society

FLUID INCLUSIONS GROUP

At the recent meetings of the International Geological Congress in Copenhagen, an announcement was made of the formation of an organizing group for an International Association for the Study of Fluid Inclusions. The organizing group is composed of Prof. Georges Deicha, l'Universite de Paris, 50 Rue de Mareil, Saint-Germain-en-Laye, Seine et Oise, France; Prof. Nicolas Ermakov, State University of Moscow, Moscow, U.S.S.R.; and Edwin Roedder, U.S. Geological Survey, Washington 25, D.C.

All persons who are interested in the study of fluid inclusions are urged to contact the organizing committee. The essential aim of the association is to promote the understanding and utilization of fluid inclusions, through personal contacts, and the exchange of information, publications and samples.

Edwin Roedder

THIRTY-EIGHTH ANNUAL MEETING DEUTSCHE MINERALOGISCHE GESELLSCHAFT

The German Mineralogical Society met in Bonn, Germany September 5-12, with a total of 305 registered mineralogists from mainly Eurpean countries. Among the papers presented that are of special interest to geochemists are the following:

S. MATTHES, Über Pyralspitsynthesen unter relativ niedrigen Drucken

A. NEUHAUS and H. BECKMANN, Strukturzustand der Lösung und Kristallwachstum im System Kupferchlorid-Wasser

H. U. BAMBAUER, G. BRUNNER and F. LAVES, Optik, Ultrarotabsorption und Spurenelementgehalt von lamellar gebautem Bergkristall

Y. HAVEN and A. KATS, Über das ultrarote Absorptionsspektrum von Wasserstoffionen in Quarzkristallen

J. LIETZ, Neue Untersuchungen zur Einwirkung von Strahlung auf ursprünglich lamellar gefärbte Rauchquarze

K. RECKER, Über den Einbau von Uran in CaF_2

A. MAAS and K. RECKER, Elektronenmikroskopische Untersuchungen an reinen und U-haltigen Alkalifluorid-Einkristallen nach Verdampfungsätzung

F. E. BURESCH, Über die numerische Behandlung von Mehrstoffsystemen

TH. ERNST, Die Entstehung der basaltischen Magmen

E. WM. HEINRICH, Types of Nb-Ta deposits in the western hemisphere

K. H. WEDEPOHL, Geochemische und petrographische Untersuchungen an einigen jungen Eruptivgesteinen Nordwestdeutschlands

H. HARDER, Einbau von Bor-Ionen in detritische Tonminerale

A. G. HERRMANN, Zur Geochemie des Strontiums in den salinaren Zechsteinablagerungen des Südharzgebietes

G. MÜLLER, Der Strontium-Gehalt vorzeitlicher Ozeane

BOOK REVIEWS

NEW INSTRUMENTS AND METHODS OF ENGINEERING GEOLOGY, by N. V. Glazov and A. N. Glazov. 91 pages. Consultants Bureau, Inc., New York, 1959. $3.25.

This is a translation of the Russian work originally from the All-Union Scientific-Research Institute of Hydrogeology and Engineering Geology, published by the State Scientific-Technical Press for Literature on Geology and the Conservation of Resources in 1957. Consultants Bureau, Inc. is to be congratulated on making this volume available to English-speaking geologists. It is essentially a series of essays involving discussions of new methods of study of geological problems.

Chapter I, on studies of deflation, erosion, and transport of material, describes the following devices or techniques: a sand trap, fluorescent dyes, and the use of radioactive tracers. Chapter II discusses the use of radioactive isotopes in studying characteristics of saline soils. Chapter III describes a variety of new instruments and methods that can be utilized in engineering geological investigations. In Chapter IV there are discussed the following: the use of radioactive tracers in obtaining data while drilling with muds, the use of radioactive tracers in hydrogeology, and vibrodrilling for engineering geological work. The final chapter is concerned with a new type of water intake. The book concludes with two appendices, (1) a table of radioactive isotopes, and (2) some rules for working with radioactive materials. There is a list of the literature cited. This is a book that should be in the libraries of all engineering geologists interested in being up-to-date on the methods devised by the Soviet scientists.

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PROGRESS IN INORGANIC CHEMISTRY, Vol. I, ed. by F. Albert Cotton. 566 pages, 93 figures. Interscience Publishers, New York, 1959. $14.50

This is the first of a series of books to be published annually. Each volume will contain articles in English, German, or French, written by leading researchers in various branches of inorganic chemistry. The contributions included in Volume I are listed and discussed in this review in terms of their relations to geology. The geologic importance of these papers depends upon (1) the occurrence in nature of the chemical compounds considered, (2) the application of the principles disclosed to geologic problems, and (3) the use of techniques described or mentioned in geochemical research. In addition the topics included in this book may be of interest to geochemists wishing to keep abreast of new developments in inorganic chemistry.

The first article, "Cyclopentadienyl and Arene Metal Compounds" by G. Wilkinson and F.A. Cotton, discusses the physical and chemical properties of a large number of metalorganic compounds of cyclopentadiene and various aromatic hydrocarbons. The metals involved fall mostly within the alkali, alkaline earth, rare earth, and transition metals groups. The properties discussed include crystal structures, dipole moments, nuclear magnetic resonance, infra-red and Raman spectra, nature of the chemical bonding, and many others. The paper is well written and gives the reader an excellent introduction to the topics considered. Cyclopentadiene is found in small amounts in coal gas; some of the hydrocarbons involved in the arene metal compounds, such as benzene and toluene, are found in petroleum. This article may, therefore, be of some interest to organic geochemists.

The second article, "Interstitial Compounds of Graphite" by Gerhart R. Hennig, considers a number of unusual compounds of graphite with various other substances. Among the compounds are included graphite oxide, graphite monofluoride, compounds of graphite and alkaline metals, compounds of graphite and metal sulfides, and compounds of graphite with metal halides. All of these compounds are quite unstable and unknown in nature. The crystal structures of these substances, however, may be of interest to mineralogists and crystallographers. Some of these compounds have unusual properties which make them particularly useful for certain analytical purposes. Geochemists may thus find them helpful in their work.

The third article is entitled "Über Schwefel-Stickstoff-Verbindungen" by Margot Becke-Goehring. This paper discusses the structure and chemical properties of sulfur compounds. In addition a few compounds containing chlorine, oxygen, and carbon are included. Apparently none of these compounds is found in nature, and, consequently, there seem to be no geologic applications for the topics discussed.

The next paper, "Metal-Ammonia Solutions" by William L. Jolly, considers the solubilities; vapor pressures; densities; magnetic, electrical, and chemical properties; thermodynamics; and photo processes of solutions of metals in liquid ammonia. As with the preceding article, there seem to be no geologic applications.

The article "Isocyanide Complexes of Metals" by Lamberto Malatesta considers the preparation and the properties of a large number of isocyanide complexes of the transition metals. The paper consists in considerable part of descriptions of the known complexes, their structures, and properties. Since cyanides are very uncommon in nature, it seems doubtful that the topics discussed will have

much geologic application.

The sixth paper is entitled "The Effect of Inner Orbital Splitting on the Thermodynamic Properties of Transition Metal Compounds and Coordination Complexes" by Philip George and Donald S. McClure. This paper is a theoretical discussion on the effects of the splitting of the energy levels in the inner electronic orbits of transition metals on the stabilization energies of their compounds and coordination complexes. When the available thermodynamic data are handled in an appropriate manner, striking regularities appear which are interpreted in terms of the theory presented. In spite of the fact that much more data is necessary before many geologic applications can be made, this article should be very helpful to geochemists, petrologists, and mineralogists who are interested in the thermodynamic properties of minerals and complex ions which are found in nature.

The final article, "The Structure and Properties of Mixed Metal Oxides" by Roland Ward, should also be of interest to geologists and mineralogists. Many of the compounds discussed in this article are not found in nature but the principles which are revealed by studies of these oxides are helpful in understanding some of the reasons for limited solid solution and for distortions of crystal structures. Following a brief introduction, the paper consists largely of a description of the various oxides which have been produced. Whenever they have been recognized, the factors influencing the crystal structure and the extent of solid solution have been discussed.

It is stated in the introduction that it is intended that all articles in this series of books "be written by one of the leading researchers in the field. The treatment is intended to be such that the article should be comprehensible, but not necessarily readily comprehensible, to a competent, Ph.D. level research worker in some branch of inorganic chemistry, but not necessarily the one under discussion." From this point of view, the articles are well written and this objective has been attained.

Paul L. Cloke

OZEANE SALZLAGERSTÄTTEN, by Hermann Borchert. 237 pages, 10 tables, 3 charts, 31 figures. Gebrüder Borntraeger, Germany, 1959. DM 48.-; approximately $12.00.

The subtitle of this book is "Fundamentals of the Origin and Metamorphism of Oceanic Salt Deposits, as well as the Structural Relations of Rock Salt Masses." This, then, is a discussion of the conditions under which marine evaporites are formed (morphology, climate, cycles, duration), together with a discussion of their post-consolidation histories including metamorphism and intrusion. Without a doubt it represents one of the most significant syntheses that has yet appeared on these sedimentary deposits.

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THE STORY OF CHEMISTRY, by Georg Lockemann. 277 pages. Philosophical Library, Inc., New York, 1959. $4.75

This is a very readable but unfortunately unillustrated general history of the development of the science of chemistry. It is divided into two parts. In part 1 the chapters deal with the pre-historic period, the period of alchemy, the period of iatrochemistry, and the transition period prior to the discovery of oxygen ("phlogiston period"). Chapters in part 2 deal with the development of chemistry from the discovery of oxygen to the mid-19th century, its development until the beginning of the 20th century, and finally the development of the science in the first half of the 20th century. The book combines a modest price with a comprehensive character, and is recommended reading.

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OPTICAL CRYSTALLOGRAPHY, by Ernest E. Wahlstrom, 3d edition. 356 pages. John Wiley and Sons, Inc., New York, 1960. $8.50

This third edition of what is rapidly becoming a standard work in the field of optical crystallography has been modernized and presents a completely re-written text. Many of the illustrations, which have always been outstanding, are new, and others have been improved. A new chapter has been added on crystal rotation techniques. Doubtless this edition will enjoy the success of its predecessors.

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THE NATURE OF SCIENCE, by David Greenwood. 95 pages. Philosophical Library, New York, 1959. $3.75.

The intention of this little book is to serve as a collection of essays on the general subject of logic and methematics as they apply to science. Following a forward by Rosgyll Ayres, the chapters deal successively with:

1. The nature of science
2. Concept formation and operational definition
3. Quantitative inductive procedures
4. Causality and the counter-factual conditional
5. The problem of real numbers.

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METHODS AND TECHNIQUES IN GEOPHYSICS, Vol. I, ed. by S. K. Runcorn. IX + 374 pages. Interscience Publishers, Inc., New York, 1960. $10.00.

This book consists of ten articles on methods and techniques in geophysics. The methods and techniques treated are largely those of measurement and observation. As can be expected in a compilation with ten separate articles, thirteen authors, and an editor, the coverage is far from uniform and some subjects are treated much more exhaustively than others. Magnetism, for example, is given over a hundred pages whereas the properties of rocks under high pressure and temperature are covered in less than twenty. As this is Volume I, some of this unevenness will probably disappear in future volumes. In any case it does not detract from the value of all of the individual articles.

The subjects covered are: geothermal gradients, heat flow, borehole surveying, geomagnetic elements, paleomagnetism, gravity at sea, seismographs, earth currents, rock properties at high temperature and pressure, and latitude, longitude and secular motion of the pole. All of the writing is by recognized authorities. This is a valuable contribution and all involved in its preparation are to be commended.

J. T. W.

TABLEAUX DES MINÉRAUS DES ROCHES, by M. Christophe-Michel-Lévy. 55 pages. Centre National de la Recherche Scientifique, Paris, 1959.

This paper-covered book is a collection of tables that present the characteristics of the principal rockforming minerals. The identification tables at the front are arranged according to uniaxial and biaxial character, with further subdivisions on crystal system and birefringence. The remainder of the work consists of a tabular presentation of data on 383 minerals, the descriptions of which are condensed under the following headings:

1. Composition
2. Specific gravity
3. Crystal system

4. Cleavage, twinning and hardness
5. Elongation and extinction
6. Optical orientation
7. Optic sign
8. Dispersion
9. Indices of refraction and pleochroism in thin section
10. Birefringence
11. Crystallographic parameters
12. Nature of the deposits and principal microchemical reactions.

The value of this work would be greatly enhanced if identification tables comparable in scope to the alphabetical tables were devised.

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ECONOMIC SURVEY OF MINERALS IN INDIA, by A. K. Madan. 228 pages. Economic and Industrial Publications, New Delhi, India, 1959. $5.00.

This volume, which is listed as Indian Mineral Resources Series No. 1, first traces the growth of the mining industry in India and then surveys the various minerals and mineral products that have been produced in the country. These include:

Abrasives
Antimony
Arsenic
Asbestos
Barium Minerals
Bauxite
Beryl
Bismuth
Boron
Cadmium
Chromite
Clays
Coal
Cobalt
Columbite and tantalite
Copper ore
Diamonds and precious stones
Feldspar
Fluorite
Gold
Graphite
Gypsum
Iron Ores
Kyanite
Lead
Limestone
Lithium
Magnesite and dolomite
Manganese ore
Mercury
Mica
Molybdenum
Nickel
Ochres
Petroleum (Crude Oil)
Phosphates
Potash salts
Silica
Sillimanite
Silver
Slate
Sodium Compounds
Steatite
Strontium
Sulphur and sulphides
Thorium
Tin
Titanium Minerals
Tungsten
Uranium
Vanadium
Vermiculite
Zinc
Zircon

The final chapter deals with problems of the mining industry, including such features as mineral policy and investment, transport, labor, conservation, mining legislation, taxation, markets and research. There are 126 tables, many of which present only world production figures on the various minerals described, but the remainder give production data for these minerals and mineral products in India.

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CALENDAR

Dec.

11-14	Am. Nuclear Soc.--San Francisco.
26-31	AAAS, Annual Meeting, New York City.

Feb., 1961

22-25	Int. Sumposium on Mining Res., sponsored by U.S. Bureau of Mines and Missouri School of Mines and Metallurgy, Rolla, Mo.
26-Mar. 2	AIME Annual Meeting, Ambassador and Chase-Park-Plaza Hotels, St. Louis

ION EXCHANGE COLUMN

New Journals

Several new journals have recently crossed the editor's desk. Two come from India. First is The Indian Mineralogist which is the Journal of the Mineralogical Society of India; it is edited by C. Rajagopalan and published half-yearly by the Society. Volume 1, No. 1 is dated January 1960 and contains 12 papers on a variety of subjects in mineralogy and crystallography, several on general topics or on mineralogical occurrences outside of India.

Dr. Sripadrao Kilpady edits the Journal of the University Geological Society of Nagpur, India. Volume 1, Nos. 4-5, for 1956-1958, includes three papers on manganese ore minerals from the Bhandara District.

Geologists in general will welcome the appearance of the Journal of Petrology published by the Oxford University Press and edited by T.F.W. Barth, C.E. Tilley, L.R. Wager and H.S. Yoder. Volume 1, No. 1 was published in September 1960. According to the journal it is the aim of the editors to provide a place for publication of original researches on the physics and chemistry of rocks, their mineralogy, dating, experimental petrology, and isotopic petrologic studies. Three numbers are to appear each year: in February, June and October.

A most comprehensive report on "Research and Equipment in France in the Field of Petrography" is presented by Marcel Roubault in French Science News, 1960, No. 2, a quarterly periodical publsihed by the Ministère des Affaires Étrangéres, Paris.

Also recently arrived is No. 13 of the Mineralogical Magazine of the Geological Society of Lvov (USSR), 1959. This volume of 475 pages is entirely in Russian but has a table of contents in English and is accompanied by a 19-page pamphlet giving English abstracts of all the articles. Articles of particular interest to geochemists are on such subjects as crystal chemistry of indium, the color of secondary nickel minerals, manganese tourmalines, sulfate-reducing bacteria in underground waters, the mineralogy of weathered basalts, and metasomatism in the formation of alkalic rocks.

A brand-new theory on the origin of granite has been presented recently by Hugh Auchincloss Brown, E.E., of Douglaston 63, New York. As nearly as we can determine, his hypothesis proposes that this highly controversial substance results from the impregnation and crystallization of ancient forest floors by underground percolating waters. Granitizationists, take heed!

Mr. Dimitry Shahnazarov of 4 Av. de Mayo 148, Buenos Aires, Argentina, announced the inauguration of a monthly publication entitled Geological, Electrical and Geochemical Methods of Prospecting. It will consist of translations from Russian papers and may be obtained by subscription. The price for the annual ten numbers is $5. Contents of the first number include:

1. Radugin, K.V. A new method of tectono-stratigraphical analysis. (From: "Problems of Soviet Geology", No. 2, Vol. I.)
2. Soldatenkov, V.E. Application of electrical survey in winter time. (From: "Prospecting of sub-soil", No. 5, 1959.)
3. Ozerova, N.P. Of the use of primary dispersion halos of quicksilver in search for lead-zinc deposits. (From: "Geochemistry", No. 7, 1959.)

One of our correspondents has submitted the following: "This caused asymmetry to develop in opposite directions on opposite sides of the faults and in the same direction on opposite sides of the same unit." --Page 472, Geol. Soc. Amer. Bull., Vol. 70, 1959, pp. 467-508. English translations are desired.

This number of the Geochemical News has been slightly delayed owing to the absence of the editor on a three-month trip to Europe and Africa following the International Geological Congress. It goes to press just before the annual meetings of the Geochemical Society in Denver, Colorado. Our next issue will give a report on the annual meetings, the results of the elections and the business transacted by the Council of the Society.

E. Wm. Heinrich
Editor

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