The Geochemical News

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ACTIVITIES OF THE AMERICAN GEOLOGICAL INSTITUTE

Owing to reorganization of AGI, members of The Geochemical Society will be called upon next fall to vote on continuation of the Society's present membership in the Institute. It, therefore, seems appropriate to review some of the major activities and publications of the AGI in this issue of The Geochemical News.

The highly diversified AGI activities have been directed toward establishing new channels of communication among earth scientists and between earth scientists and the general public, toward the gathering of professional statistics and the study of professional standards, and most significantly toward the improvement of earth science instruction on all educational levels. In each of these areas, the work of the Institute has been eminently successful.

Members of the Society are perhaps most familiar with the periodical AGI publications including GEOTIMES, which now has an international circulation of over 25,000, and GEOSCIENCE ABSTRACTS, a monthly journal offering excellent coverage of the geological literature pertaining to North America. AGI translation journals include the IZVESTIYA OF THE ACADEMY OF SCIENCES OF THE USSR (GEOLOGICAL SERIES), DOKLADY OF THE ACADEMY OF SCIENCES OF THE USSR (EARTH SCIENCES SECTIONS), and the INTERNATIONAL GEOLOGY REVIEW, which presents translations of the more significant contributions to the geologic literature appearing in foreign journals and lists others translations newly available through other sources. GEOTIMES is currently sent to all members of The Geochemical Society as a part of their membership, and substantially lower subscription rates for the other periodicals apply to individuals in AGI member societies.

The AGI DIRECTORY OF GEOSCIENCE DEPARTMENTS is an invaluable compilation of information on the faculties, courses, and degree requirements of all United States and Canadian earth science departments. The annual SURVEY OF GEOLOGY-GEOPHYSICS STUDENTS offers a breakdown of enrollments in 271 degree-granting departments and at three-year intervals includes data on scholarships, fellowships, assistantships, and grants-in-aid available at each of these departments. These are only selected examples of the many AGI educational publications which also include the GLOSSARY OF GEOLOGY AND RELATED SCIENCES, DIRECTORY OF GEOLOGICAL MATERIAL IN NORTH AMERICA, and others.

Outstanding among the AGI activities are those programs directed at improvement of geological training on the university levels. The VISITING GEOLOGICAL SCIENTIST PROGRAM brings recognized American geo-scientists to smaller college departments to improve and stimulate geological instruction. Now in its fourth year, this NSF-supported program has resulted in a total of 100 such visits by about 50 prominent geologists. For each of the past three years, five internationally recognized authorities in the geological sciences have undertaken three-month tours of graduate departments of geology-geophysics under the sponsorship of the NSF-supported AGI VISITING INTERNATIONAL SCIENTIST PROGRAM. As a broadening experience for selected faculty, the Institute offers its INTERNATIONAL FIELD INSTITUTE FOR COLLEGE GEOLOGY TEACHERS, an 8-week summer program of field study in classic geologic areas under the leadership of foreign geologists.

The many facets of AGI service defy complete summary in a brief review of this kind. However, other significant contributions to public relations, career guidance, and earth science programs in the secondary and elementary schools were recently described in the March (1962) issue of GEOTIMES and members of The Geochemical Society may wish to refer to this more comprehensive treatment when the matter of continued association with the AGI comes up for their vote in the fall.

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GEOCHEMISTRY IN ANCIENT CHINA

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We are indebted to Professor J. Needham (Cambridge) for having brought to light forgotten geochemical knowledge and techniques in his book SCIENCE AND CIVILISATION IN CHINA, VOLUME 3: MATHEMATICS AND THE SCIENCES OF THE HEAVENS AND THE EARTH.* The present note should be considered only a paraphrase of Needham's text, owing to our incompetency in Chinese history.

Professor Needham shows, among other things, that botanical associations with ores were recognized at least as early as the 8th or 9th Century A. D. and were published in the YU-YANG TSA TSU by Tuan Chhêng-Shih:

allium fistulosum	with silver
allium bakeri	with gold
zingiber officinale	with copper and tin.

Precious jade may also be detected by the drooping of tree branches.

In another book, the TI CHING THU (first half of the +6th Century), correlations are found between appearance of plants and underlying ores (lead, tin, copper). Still another book from circa 1120, referring to an author of the 3rd Century, A. D., states a correlation between polygonum hydropiper and haematite.

A lot of modern-looking facts on metal concentrations in plants are to be found in books going back as far as the 15th and 16th Centuries A. D., which quote sometimes-lost earlier writings:

gold is found in brassica rapa-depressa;

silver in a kind of weeping willow;

lead and tin in artemisia vulgaris, chestnut, barley, and wheat;

copper in oxalis corniculata.

Mercury was said to be extracted from portulaca oleracea. A concentration of 8 or 10 ounces of mercury per 10 catties (circa 6 kg) of dried plant is stated.

An interesting point is strongly emphasized by Professor Needham; i.e., the link between Chinese geobotanical knowledge and European medieval and

*Cambridge University Press (1959).

modern science. We cannot do better than to recommend that the reader, himself, have a look at this interesting chapter, but there seems to be a rather clear link leading perhaps not directly to Agricola, whose indications about plants growing above ore veins are well known, but to his contemporary, the geographer Philip Cluverius.

SYMPOSIUM ON "POSTMAGMATIC ORE DEPOSITION"

The Geochemical Society has recently joined the Geological Survey of Czechoslovakia, Charles University, and the Czechoslovak Academy of Sciences as one of the sponsoring organizations of the symposium to be held September 16-21, 1963, in Prague, Czechoslovakia. As noted in the announcements in The Geochemical News (nos. 27, 28) and in Economic Geology (v. 56, p. 465) discussions are to be focused on (1) causes of mineral zoning, (2) ore transport chemistry, (3) pneumatolytic processes, (4) metacrysts of minerals, and (5) replacement in hypogene ores.

Sessions are to be organized considering, first, the papers for which extended abstracts were to be submitted last December and, second, invited comprehensive papers on these topics. Official languages are English, French, German, Russian, Spanish, and Italian.

Field trips are planned to visit several classic districts; those before the meeting will be of 3-4 days duration and those following will last 5 days. Descriptive circulars are available from the General Secretary of the Symposium, Miroslav Štemprok, Ústřední ústav geologický, 19. Malostranské nám., Praha 1-Malá Strana, Czechoslovakia.

This international symposium offers a unique opportunity for the exchange of views on the geochemistry of ore formation with scientists from eastern and western Europe.

H. L. Barnes

TABLE OF COMMON LOGARITHMS AND THEIR SQUARES

A new "Table of common logarithms and their squares" by Josephine G. Boerngen was released to the open files of the U. S. Geological Survey on January 24, 1962. The Office of Technical Services, Department of Commerce, announced its availability for sale for $0.75 as report PB 181 100 in their U. S. Government Research Reports, v. 37, no. 6, p. S-21. They extracted the following paragraph to describe the table:

> "The table gives all whole numbers from 1 to 1,000 and by one hundreds from 1,000 to 10,000; the 5-place logarithms of the numbers taken from War Department Technical Manual 5-236, table 1 (1940, p. 8-27); and the square of the logarithm of each number, computed to ten places but rounded off to five places. Truncation errors may be as much as 1 unit in the fifth digit."

This table should be of use to geochemists who lack computer facilities or who for other reasons do not tackle the statistics of logarithmic distributions because of the computational problem.

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BOOK REVIEWS

PHYSICS IN THE SOVIET UNION, by A. S. Kompaneyets (tr. from Russian; ed. George Yankovsky). 592 pages. Philosophical Library, New York 16, N. Y., 1962. $7.50.

Both the author and the translator are to be highly complimented for the lucid presentation obtained in this text. Wording and grammatical construction seldom give a hint that the work is a translation.

Subject matter, organization of theoretical development, and level of mathematics should make this text ideal as a reference to the geoscientist working in quantitative lines of research. Even those with an elementary knowledge of differential equations, analytical mechanics, and thermodynamics will find the theory of more advanced concepts developed rapidly, but still very clearly. The author begins his discussions at a level that should be familiar ground and proceeds immediately toward the goal of his topic. Mathematical developments are rigorous, but are kept at a level that is easy to follow. In many ways this text can be considered a work that bridges the often mysterious void between "classical" physics and "modern" physics.

Part I, Mechanics condenses into a small space many of the basic concepts of mechanics with which the geoscientist should be familiar. The author starts his discussion by developing the concept of generalized coordinates and presents a derivation and discussion of Lagrange's equation. With this reasonable foundation, many concepts of dynamics and elementary potential theory can be investigated with a minimum of effort.

Part II, Electrodynamics is probably of primary interest to the geophysicist. There are topics presented that can be applied to geochemical problems.

Part III, Quantum Mechanics should be of about equal interest to the geochemist and geophysicist. Many topics are considered which are basic to understanding works on the physics of solids.

Part IV, Statistical Physics provides an informative discussion of various statistical methods as applied to physics. The topics treated here are basic to an understanding of thermodynamics and the physics of solids. This portion will probably be of more value to readers from the geoscience fields than other parts of the text.

John M. DeNoyer

A TREASURY OF WORLD SCIENCE, edited by Dagobert D. Runes with an introduction by Wernher von Braun. xxi plus 978 pages. Philosophical Library, New York 16, New York, 1962. $15.00.

This is an anthology of some of the fundamental writings of scientists that go back to the time of Archimedes and Euclid. Selections in nearly all disciplines are represented, including metallurgy, physics, chemistry, medicine, surgery, astronomy, geology, mineralogy, zoology, botany, paleontology, economics, mathematics, and psychology as well as several other fields. The earth sciences are represented by selections from the writings of Agricola, Robert Bunsen, Marie Curie, Charles Darwin, William Morris Davis, James Hall, Thomas Huxley, Charles Lyell, and Leonardo da Vinci. Chemistry is represented by selections from the works of Adolf Baeyer, Berzelius, Euclid, Thomas Graham, Laboisier, Mendeleev, Nernst, and Ostwald among others. The editor, who is a doctor of philosophy from the University of Vienna and a well-known scholar and author, has made a very judicious choice for his inclusions.

All of the works are in English translation. The arrangement of the material, which is alphabetical by author, is perhaps not the best that could have been devised. It seems to the reviewer that a more useful arrangement

would have been either by discipline or historically. The selections of each scientist are prefaced by a very short statement regarding his position in the field of science, but unfortunately not all of the selections have the original source cited for them.

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ORE MICROSCOPY, by Eugene N. Cameron. 293 + vii pages. John Wiley and Sons, New York, 1961. $10.50 (Professional), $8.75 (Textbook).

Those involved in the teaching or applications of ore microscopy have long realized the need for a book summarizing the more quantitative microscopic techniques of ore mineral identification that have developed rapidly in the last fifteen years. Pre-eminently qualified for such an undertaking, Cameron has prepared an authoritative and comprehensive text that should admirably fulfill this need.

The author has emphasized the techniques of ore mineral identification rather than the applications of microscopy to more subjective interpretations of ore textures. Among the techniques discussed, stress is placed upon the more quantitative methods such as measurement of indentation microhardness, reflectivity, and rotation properties at the expense of less definitive methods such as microchemical testing.

An early chapter is devoted to description of modern reflecting microscopes suitable for measurement of the rotation properties of the ore minerals and valuable suggestions are offered for the adaptation of older microscopes to more quantitative work. Here, as through the book, the author presents a carefully selected bibliography and makes frequent reference to commercial sources of materials and equipment. This reviewer was disappointed to learn that the Bausch and Lomb Model O ore microscope especially adapted to measurement of the polarization properties of the ore minerals (referred to here and elsewhere in the text) is no longer available through that company. A chapter on preparation of polished sections considers both the Graton-Vanderwilt and diamond abrasive methods of polishing and includes an interesting discussion of the use and preparation of polished thin sections. The physical properties of the ore minerals are next discussed with the emphasis more heavily upon the diagnostic value of these properties for identification purposes than on their genetic significance. Recent studies of indentation microhardness are well represented in this chapter and the value of quantitative data obtained by this method is stressed. The reviewer objects to the concluding statement that the use of microhardness will be limited by the expensive nature of the necessary equipment. Although some indentors are quite costly, the very promising research of Bowie and Taylor was carried out with an instrument (GKN) no more expensive than the costs of adapting an older microscope for quantitative measurement of the rotation properties of the ore minerals.

The outstanding feature of this textbook is the concise, lucid and well-illustrated exposition of the theory and practice of the measurement of certain of the optical properties of the ore minerals as presented in chapters 5 and 6. In chapter 5, the student is introduced to the optical properties (color, bireflectance, anisotropism, reflectivity, etc.) and the practicalities of their measurement. In chapter 6, the author presents the theory of reflected light and offers a theoretical explanation of the rotation phenomena. Although this is difficult ground to cover, the explanations are remarkably well organized and articulated.

Chemical contact printing and conventional microchemical testing are surveyed in chapter 7 and tables listing tests for specific elements are presented in the appendices. A valuable chapter on "Systems of Mineral Identification" reviews schemes that have been employed in the past and points out other possible systems based on combined measurements of quantitative properties such as the rotation angle and reflectivity or microhardness and reflectivity. The closing pages of the book are devoted to applications of ore microscopy to analysis of solid and loose ore materials and of mill products.

In addition to the chemical tables mentioned above, the appendices include valuable tabulations of Vickers hardnesses, polishing hardnesses, reflectivities, internal reflections, and rotation properties of the ore minerals. The great need for standardization in this field is attested to by the variety of sources and methods listed for standard measurements of such properties as reflectivity. The compilation of rotation data for 82 anisotropic ore minerals are an invaluable addition to the literature and should encourage a more rapid acceptance of these quantitative optical measurements than we have seen in the recent past.

The emphasis on methods, and in particular on the more quantitative microscopic techniques, is such that the student will still have to turn to other texts for the interpretive aspects of ore microscopy and many departments will find themselves inadequately equipped to teach the methods stressed by Cameron. These, however, are not arguments against the book, which this reviewer considers a superb contribution to a field needing more rigorous technique.

WCK

PUBLICATIONS RECEIVED

BAAR, A. und R. KÜHN. Der Werdegang der Kalisalzlagerstätten am Oberrhein. N. Jb. Miner., Abh., Stuttgart, 97, (3), 289-336, January 1962.

De CARVALHO, G. SOARES. Problemas das "Laterites" da Provincia da Guiné. Museu Lab. Mineral. Geol. Facul. Ciências Do Porto, LXXIX, 4.ª, 1-28, 1961.

D'OLIVEIRA, HENRIQUE VIERIA and REINALDO CUNHA. Análise térmica diferencial de minerais portugueses. Museu Lab. Mineral. Geol. Facul. Ciências Do Porto, LXXVIII, 4.ª, 1-17, 1959.

MANHEIN, F. In situ measurements on pH and Eh in natural waters and sediments. Ekenas Tryckeri Aktiebolag, Finland, 27-36, 1961.

MÜLLER, VON DIETRICH. Einige Bemerkungen über die Vererzung der Scharfenberger Erzgänge, insbesondere der Gänge der Grube "Güte Gottes". Sonderdruck aus "Bergakademie", 10, 617-623, 1961.

OELSNER, VON OSCAR. Zur genese der nord- und mittelschwedischen eisenerzlagerstätten. Geol. Jahr. 10, Heft 6, Berlin, 601-622, 1961.

OMORI, KEIICHI. Infrared absorption spectra of some essential minerals. Sci. Rpts., Tohoku Univ. Ser. III, VII, (1), 101-130, 1961.

RIECKER, ROBERT E. Hydrocarbon fluorescence and migration of petroleum. Bull. AAPG, 46, (1), 60-75, 1962.

WHITE, J. F. High- and low-temperature feldspars in granitic xenoliths in diabase. Univ. Cal. Pub. Geol. Sci. 38, (3), 151-176, 1962.

WILSON, ALLAN F., W. COMPSTON, P. M. JEFFERY and G. H. RILEY. Radioactive ages from the Precambrian rocks in Australia. Jour. Geol. Soc. Australia, 6, (2), 179-196, 1960.

CALENDAR

July	
9-14	Internat. Cong. on Glass, 6th, Washington, D. C. Write: C. H. Hahner, Internat. Comm. on Glass, c/o Glass Section, Nat. Bur. Standards, Washington 25, D. C.
25-27	Internat. Union of Crystallography. Write: Prof. F. Bopp, Institut für Theoretische Physik der Universtät Munchen, Schellingstrasse 4-8, München 13, Germany.
30-Aug. 10	Advanced Seminar in Recent Advances in Clay Mineralogy, Penn. State Univ., Univ. Park, Pa.
Aug.	
6-7*	Rocky Mtn. Spectroscopy Conf., 5th Ann., Olin Hotel, Denver, Colo.
8-10	Conference of Application of X-Ray Analysis, 11th Ann., Albany Hotel, Denver, Colo. Write: W. M. Mueller, Denver Research Inst., Univ. of Denver, Denver 10, Colo.
13-17	Clay Minerals Conf., 11th Ann., Chateau Laurier Hotel, Ottawa, Canada. Write: D. Hunka, Exec. Sec'y., 11th Clay Minerals Conf., Nat. Research Council, Ottawa, Canada.
20-24	Soil Science Soc. of America, Ann., Cornell Univ., Ithaca, New York. Write: M. Stelly, Exec. Sec'y., Amer. Soc. of Agronomy, 2702 Monroe St., Madison 5, Wis.
20-25	Internat. Cong. of Limnology, 15th, Madison, Wisconsin. Write: A. Halser, Chairman, c/o Department of Geology, Univ. of Wisconsin, Madison, Wisc.
Sept.	
9-14	Amer. Chem. Soc., 142nd Ann., Atlantic City, New Jersey.

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*The Fifth Annual Rocky Mountain Spectroscopy Conference will be held in Denver, Colorado, on August 6 and 7, 1962 at the Olin Hotel. This meeting, sponsored by the Rocky Mountain Section of the Society for Applied Spectroscopy, immediately precedes the 11th Annual Denver Research Institute X-Ray Conference, August 8, 9, and 10.

Featured during the Conference will be four individual symposia: trace analysis, analysis of medical and biochemical materials, uses for the vacuum ultraviolet region of the spectrum, and analysis of mineralogical materials. There will be a social hour and banquet Monday evening, August 6, at which Dr. Wallace R. Brode will be the speaker.

The program committee requests that titles and abstracts of technical papers in all fields of spectroscopy be submitted to Mr. Francis S. Bonomo, Denver Research Institute, University of Denver, Denver 10, Colorado.

ION-EXCHANGE COLUMN

Publications

An up-to-date list of Czech publications in geology and related sciences is available from Artia, Prague, Czechoslovakia. Publications from the following institutions are listed:

Geological Survey of Czechoslovakia, Prague

Dionýz Štúr's Geological Institute, Bratislava

Czechoslovak Academy of Sciences, Prague and the Brno Branch of the Czechoslovak Academy of Sciences

Slovak Academy of Sciences, Bratislava

Silesian Institute of the Czechoslovak Academy of Sciences, Opava

National Museum, Prague

Museum of Moravia, Brno

Charles University, Prague

Palacký's University, Olomouc

High School of Mining, Ostrava and other publishing houses

Prices and ordering directions are also given.

Taylor and Francis, Ltd., of Red Lion Court, Fleet St., London E.C. 4, announces the publication of CURRENT BIBLIOGRAPHY FOR AQUATIC SCIENCES AND FISHERIES, vol. 3, published by permission of The Food and Agriculture Organization of the United Nations. Price per part, $2.60 plus postage; per volume (12 pts.), $27.00 postpaid.

Kleber Laboratories, Inc., Burbank, California, has published vol. 1, no. 1 of Rare Earth Research Notes, a newsletter designed to be a continuing source of information on recent advances in the technology of the rare earth elements. Available by writing RERN, Kleber Laboratories, Inc., P. O. Box 68, 2530 N. Ontario St., Burbank, Cal.

Academic Press, 111 Fifth Ave., New York 3, have initiated a new journal, Journal of Catalysis, (in English). Vol. 1,no. 1 appeared in February of 1962. Editors are J. H. de Boer of Delft Technological University and P. W. Selwood of Northwestern University. Cost for vol. 1 (6 issues) is $18.00.

A new journal, Sedimentology, is to be published quarterly by Elsevier Publishing Co., Amsterdam, for the International Association of Sedimentology. The editor-in-chief is A. Brouwer of Leiden. Subscription price is $10.00 postpaid; the first number appeared in February, 1962.

The University of Texas, Bureau of Economic Geology, has published an attractive and informative summary of the activities, organization, and staff of the Bureau for 1961. Write: Bureau of Economic Geology, The University of Texas, University Station, Box 8022, Austin 12, Texas.

Professor Konrad B. Krauskopf, former secretary of The Geochemical Society and associate dean of the Stanford School of Mineral Sciences, has been named chairman of the Cordilleran Section of The Geological Society of America.

Professor Chalmer J. Roy, chairman of the Department of Geology, Iowa State University, has been appointed Dean of the College of Sciences and Humanities.

Sand-in-the-Gears-of-Learning Department

Some graduate students work on their theses so long that they go directly from the university to social security.

Gemstone Jemmy says, "Quartz can't be used for necklace pendants, because it lacks cleavage."

Microscopic lens doth show
Water teems with creatures queer
What a comfort 'tis to know
There are no such things in beer!
Anon.

Selected Daffynitions from our Unabashed Fictionary:

Grunge: A geologist who has been in the field for at least one week without a bath, without changing clothes, and without shaving. When a person has attained this state of affairs, he feels grungy.

Larderellite: A sebaceous exudation produced by the genus Erella.

Illite: A mineral having a sickly glow.

Vaterite: A mineral synthesized in a big barrel.

Jarlite: A mineral synthesized in a small barrel.

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