



The Geochemical News

NUMBER 29

December 1961

REPORT ON THE ANNUAL MEETING

The Council of The Geochemical Society met in Cincinnati at the Netherland Hilton Hotel twice during the Annual Meetings of the Society, November 1-4, 1961. These meetings, as usual, were held in conjunction with The Geological Society of America and allied societies. It is estimated that over 1,500 geologists, mineralogists, and geochemists attended. The Council met Thursday, November 2nd, from 9-12 a.m. under President Harold C. Urey. The second session came Saturday noon, November 4th, at a luncheon meeting with Robert M. Garrels presiding. Two new councilors, D. M. Shaw and Bartholomew Nagy, and the new treasurer, C. Wayne Burnham, participated. Reports of the proceedings and committee reports will appear in the February 1962 number of *The Geochemical News*.

The presidential address by Harold C. Urey entitled "Evidence Regarding the Origin of the Earth" was delivered Friday at 10:30 a.m. at an exceptionally well-attended session. A business meeting followed.

Geochemistry was especially well represented in the scientific sessions. The program of geochemical papers follows:

Nov. 2, Thursday Afternoon. INORGANIC GEOCHEMISTRY I, GEOCHRONOLOGY
H.W. Fairbairn and Bruno J. Giletti, Co-chairmen

R. BERMAN and L.F. HERZOG: X-ray Fluorescence Rb-Sr ages of lepidolites, II

FRASER P. FANALE and J.L. KULP: Dating of Magnetite and other ore minerals by the U, Th-He method

GORDON GASTIL: Effect of contact metamorphism on the lead content of detrital zircon at Owlshhead Peak, California

BRUCE R. DOE and STANLEY R. HART: Effect of contact metamorphism on the isotopic composition of lead in K feldspars

G.N. HANSON and P.W. GAST: Contact metamorphic alteration of K-Ar and Rb-Sr biotite ages in the Snowbank intrusive

W.H. PINSON, M.L. BOTTINO, and H.W. FAIRBAIRN: Rb-Sr ages of Tertiary volcanic rocks

G.P. ERICKSON and J.L. KULP: K-Ar dates on ocean floor basalts

J. HOWER, P.M. HURLEY, W.H. PINSON, and H.W. FAIRBAIRN: Effect of mineralogy on K-Ar age as a function of particle size in a shale

P.M. HURLEY, J.M. HUNT, W.H. PINSON, and H.W. FAIRBAIRN: K-Ar age values on the clay fractions in shales ranging in age from Tertiary to Ordovician

E.J. CATANZARO: Uranium-lead age determinations in Montana

PAUL E. DAMON, DONALD E. LIVINGSTON, and BRUNO J. GILETTI: Extension of the older Precambrian of the Southwest into Sonora, Mexico

Nov. 3, Friday Afternoon. INORGANIC GEOCHEMISTRY II, GENERAL
C. Wayne Burnham and Karl K. Turekian, Co-chairmen

NORMAN O. SMITH, STEVE P. KELEMEN, and BARTHOLOMEW NAGY: Solubility of nitrogen in aqueous salt solutions at pressures to 1000 PSIA

ERNEST E. ANGINO and KENNETH B. ARMITAGE: Geochemical study of lakes Bonney and Vanda, Victoria Land, Antarctica

W.F. WEEKS and O.S. LEE: Salinity distribution in young sea ice

W.D. KELLER and A.L. REESMAN: Fifteen glacial milks and laboratory-prepared analogues

VINCENT G. HILL and W. JONES: Anomalous potassium content of the water from some wells in the Pedro Plains, Jamaica, West Indies

JOHN A.S. ADAMS: Radiometric determination of thorium, uranium, and potassium in the field

MARY-CORNELIA KLINE, JOHN A.S. ADAMS, and JOHN J.W. ROGERS: Anomously high thorium content of the Westerly, Rhode Island, granite (G-1 standard) and other New England granites

H.W. FAIRBAIRN, GUNTER FAURE, P.M. HURLEY, and W.H. PINSON: Evidence of the origin and time of separation of magmas of the Monteregian Hills, Quebec, from development of radiogenic Sr⁸⁷

H.P. SCHWARCZ, R.N. CLAYTON, and T.K. MAYEDA: Oxygen isotope variations in metamorphosed calcareous rocks of New England

JAMES R. O'NEIL and ROBERT N. CLAYTON: Oxygen isotope fractionation in the system quartz-water

M. GRANT GROSS: O^{18}/O^{16} and C^{13}/C^{12} ratios of diagenetically-altered limestones in the Bermuda Islands, Bikini and Eniwetok atolls

Nov. 3, Friday Afternoon. ORGANIC GEOCHEMISTRY I
Paul A. Witherspoon and Harold M. Smith, Co-chairmen

GAYLE K. BLANKENSHIP and BRUCE W. NELSON: Behavior of Rappahannock River sediment organic matter during chromatography

ROBERT R. THOMPSON: Chromatographic effects of sedimentary minerals in regard to certain petroleum constituents

G.W. HODGSON and ERIC PEAKE: Chlorin and porphyrin metal complexes in recent sediments

YASUSHI KITANO and DONALD W. HOOD: Effect of organic material on the polymorphic forms of $CaCO_3$

P. EDGAR HARE: Variations in the composition of the organic matrix of some modern calcareous shells

JAMES B. RUCKER and JAMES W. VALENTINE: Paleosalinity prediction using trace-element concentration in oyster shells

JOSEFINA LUGAY, LUBOMYR TARANKO, and BARTHOLOMEW NAGY: Oxidative degradation of asphaltenes

Nov. 4, Saturday Morning. INORGANIC GEOCHEMISTRY III, PHASE EQUILIBRIA
H.S. Yoder, Jr., and Donald L. Graf, Co-chairmen

D.L. HAMILTON and C. WAYNE BURNHAM: Solubilities of water in a basaltic melt and effect of level of oxygen fugacity on crystallization of a water-saturated basaltic melt

CHARLES J. SPENGLER and C. WAYNE BURNHAM: Compositions in the upper three-phase region of the system $KAlSi_3O_8-H_2O$ at pressures up to 6 kilobars

R.F. FUDALI, A. MUAN, and E.F. OSBORN: Oxygen fugacities of basaltic magmas

WILLIAM S. WISE and HANS P. EUGSTER: Synthesis and stability of celadonites

E-AN ZEN: Phase-equilibrium studies of the system $CaSO_4-NaCl-H_2O$ at low temperatures and 1 atmosphere pressure

MELVIN N.A. PETERSON: Mineral assemblages from evaporitic rocks, in the system $MgO, CaO, Al_2O_3, SiO_2, CO_2, H_2O$

FRANK DACHILLE and RUSTUM ROY: Effectiveness of shearing stresses in accelerating solid-phase reactions at low temperatures and high pressures

J.T. IIYAMA and RUSTUM ROY: Controlled synthesis and relative stabilities of random and regular "mixed-layer" (heteropolytypic) minerals

A.M. TAYLOR and RUSTUM ROY: Structural and compositional changes on dehydration of the Na-P zeolite family

R.K. DATTA and RUSTUM ROY: Order-disorder in $MgAl_2O_4$ (spinel)

ROBERT G. SCHMALZ: Cell-size anomalies in carbonates from Funafuti Atoll

Nov. 4, Saturday Morning. ORGANIC GEOCHEMISTRY II, STABLE-ISOTOPE GEOCHEMISTRY
Sol R. Silverman and Walter R. Eckelmann, Co-chairmen

EGON T. DEGENS and SAMUEL EPSTEIN: Stable isotope studies on marine and continental dolomites from recent and ancient sediments

I.R. KAPLAN: Distribution and S^{32}/S^{34} composition of sulfur compounds in recent marine sediments off Southern California

WALTER R. ECKELMANN, ROBERT A. LUPTON, DAVID W. WHITLOCK, and JERRY R. ALLSUP: Carbon isotopic composition of the total organic carbon of some recent sediments

W.M. SACKETT and R.R. THOMPSON: Stable carbon isotopes in organic material in upper Gulf of Mexico and near-by continental sediments

THOMAS C. HOERING: Carbon isotope ratios in carbonates and reduced carbons from ancient sediments

S.R. SILVERMAN: Evidence for an age effect in the carbon isotopic compositions of natural organic materials

Nov. 4, Saturday Morning. ORGANIC GEOCHEMISTRY III
Harold M. Smith, Moderator; John M. Hunt and Gerald U. Dinneen, Discussion Leaders

WERNER BERGMANN MEMORIAL DISCUSSION: Kerogen in oil shale and other sedimentary rocks

Nov. 4, Saturday Afternoon. INORGANIC GEOCHEMISTRY IV, GENERAL
Leon T. Silver and D.B. Stewart, Co-chairmen

ALFRED H. TRUESDELL: Electrode functions and ion-exchange equilibria of natural glasses

L.L. AMES, JR.: Volume relationships during replacement reactions

ERNEST BOLTER: Alteration sequence in potassic olivine basalts

PAUL L. CLOKE: Role of sulfide and polysulfide complexes in the formation of ore deposits

R.A. YUND: Polymorphic relations of pararammelsbergite-rammelsbergite

KARL K. TUREKIAN: Rates of accumulation of several trace elements in a carbonate-rich Atlantic deep-sea core

JAI N. SHRIVASTAVA and PAUL DEAN PROCTOR: Trace-element distribution in the Searchlight, Nevada, quartz monzonite stock

CARLETON B. MOORE: Petrochemistry of the achondrites

PAPERS PRESENTED BY TITLE:

SARKIS G. AMPIAN: Inversions of Ca_2SiO_4 and NaAlO_2

R.I. HARKER, D.M. ROY, and O.F. TUTTLE: Melting phenomena in the system $\text{CaO-SiO}_2\text{-H}_2\text{O}$

V.G. HILL: Geochemical prospecting for nickel in the Blue Mountain area, Jamaica, West Indies

J.W. MEYER and J.C. YANG: Reinvestigation of the system $\text{MgO-H}_2\text{O}$

FREDERIC R. SIEGEL: Artificially-induced thermoluminescence of sedimentary dolomites

FREDERIC R. SIEGEL: Synthesis of dolomitic carbonate

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SUGGESTIONS TO THE AUTHORS OF WRITTEN CONTRIBUTIONS
TO THE PRAGUE SYMPOSIUM, 1963

In order to answer many inquiries concerning written contributions for the pre-symposium volume and to facilitate the work of the authors, the General Secretary gives the following information:

1. Contributions to the individual questions must be written in one of the official languages of the International Geological Congresses (English, French, German, Russian, Spanish, Italian).
2. The individual questions (topics) are as given in the first circular by the General Secretary in single points 1a, 1b, 1c, 1d, 2, 3, 4, 5*. These topics have also been published in Economic Geology, Vol. 56, p. 465, 1961; Geotimes, Vol. 5, No. 8, p. 37, 1961; Zeitschrift für angewandte Geologie, Vol. 7, Hft. 5, p. 272, 1961; The Geochemical News, No. 27, p. 4, 1961; and in some Soviet and Czechoslovak geological periodicals.
3. The number and selection of questions answered is left to the author's own discretion.
4. Contributions to each question (single topic) must not exceed five type-written pages, double spaced, and accompanying illustrations not more than an additional two pages.
5. Each contribution must be designated either by the question itself or by a title expressing more adequately the contents of the paper.
6. If some words of the text are to be printed in italic -- for instance, special terms on which stress is laid -- they must be underlined by a wavy line ~~~~~; those to be printed with spacing -- for instance, local names on which special stress is laid -- must be underlined by a dashed line _ _ _ _ . Parts of the text to be printed in smaller letters must be marked in the left margin by a vertical line and the note "petit". The underlining or the vertical line should be made in pencil.
7. The list of literature should be written according to the following example:

Daubrée, A. (1841): Sur le gisement, la constitution et l'origine des amas de minerai d'étain. Ann. Mines, 20, 65-112.

Ramdohr, P. (1950): Die Erzminerale und ihre Verwachsungen. Berlin.

References cited should be listed as follows: the names of authors in alphabetical order; the papers of one author chronologically under the name of the author, the oldest publications first.
8. The collected papers will be published in a volume of B-5 size, so that the maximum space available on a printed page (after reproduction) for a text-figure is 12.5 x 19 cm. The text (symbols) in the illustrations should be written in letters of such a size that after reproduction they will not be smaller than 2 mm.
9. If it is inevitable to accompany the text by black and white drawings of larger dimensions, they should be inserted as folded illustrations not exceeding the printed size limits of 55 x 50 cm each.

*Thus the individual questions of zoning (Nos. 1a, 1b, 1c, 1d) may be treated separately in several contributions, none of which may exceed five pages.

10. Each illustration must be marked (photographs on the back) with the number of the relevant question (topic), the name of the author, and the serial number of the illustration. The photographs must be arranged and numbered in one series, the drawings in another. The photographs will be reproduced on art paper.
11. On a special page (which is not included in the maximum five-page limit) titles and explanations of the illustrations should be given. They should be arranged as follows: titles (and explanations) of text-figures, titles (and explanations) of photographs, and, if necessary, titles (and explanations) of folded illustrations.
12. All communications concerning the symposium should be addressed to the General Secretary of the Symposium 1963, Ústřední ústav geologický, Malostranské nám. 19, Praha 1, Malá Strana.

The General Secretary wishes to remind all authors interested that the written contributions should reach the General Secretary before December 15, 1961.

M. Štemprok
General Secretary

Z. Nýpl
Organizational Secretary

AGI INTERNATIONAL FIELD INSTITUTE
FOR COLLEGE GEOLOGY TEACHERS

The Alps, 1962

An International Field Institute for U.S. college and university teachers of geology will be conducted in the Alps during the summer of 1962 by the American Geological Institute under a grant from the National Science Foundation.

The objective of this eight-week summer field program will be to provide an opportunity for a selected group of college teachers to study classic geologic features of the Alps of Switzerland and adjacent areas of France, Italy, and Austria in the field under the leadership of widely-recognized Swiss research scientists. The Alps are outstanding among the fold-mountain systems of the world and have been the subject of intensive study since the emergence of geology as a scientific discipline.

The AGI program will be under the leadership of one U.S. and two Swiss geologists as co-directors:

Professor Augusto Gansser, Federal Technical Institute, Zurich
Professor Augustin Lombard, University of Geneva
Professor D. L. Blackstone, Jr., University of Wyoming

Also serving as field leaders for various portions of the field program will be: Heli Badoux, University of Lausanne; Rene Herb, Geological Institute, Zurich; Rudolph Trumpy, Swiss Institute of Technology and University of Zurich; Marc B. Vuagnat, University of Lausanne; and Eugene Wegmann, University of Neuchatel.

The twenty participants will be chosen from the field of applicants by an AGI Selection Committee, Institute participants will receive travel and subsistence allowances. Application forms and announcement brochures are being mailed to all four-year colleges and universities offering geology.

Applications must be filed before February 1, 1962. Application inquiries should be addressed to Professor D.L. Blackstone, Jr., AGI-IFI-Alps 1962, c/o Department of Geology, University of Wyoming, Laramie, Wyoming.

ROCK STANDARDS PROGRAM

In the June 1961 issue of The Geochemical News, the availability of ten fluorine rock standards for those interested in a rock standards program was announced. Dr. R.P. Hollingworth wished to clarify two items in that announcement:

First, the ten samples are not part of a standards program under the auspices of the Geological Survey of Canada. They were prepared by Dr. Hollingworth, a National Research Council Post-Doctorate Fellow now at the Survey.

Second, the samples are available only to those participants who will do the fluorine determinations. Perhaps, after participants have done fluorine determinations, they may arrange among themselves an interlaboratory program for other elements, using remaining sample material. These rocks were prepared for an interlaboratory standardization program of fluorine analysis, and Dr. Hollingworth believe that the program for this element must take priority for the present.

ISOTOPE PROJECTS OF THE GEOLOGICAL SURVEY OF CANADA

R. K. Wanless

Current isotope investigations embrace two branches of isotope geology:

1. The calculation of the geological age of minerals and rocks based on the determination of parent and daughter isotope ratios.
2. The study of stable isotope variations in natural settings and their relation to chemical and physical processes operative during the formation of ore and mineral deposits.

A comprehensive reconnaissance age programme based on the K/Ar decay scheme is being carried out in the Canadian Shield. The results of this work are to be used in the development of a geological time scale for Precambrian time. In addition, this preliminary work will serve to point up problems requiring detailed study through the application of more than one dating method.

Stable isotope studies have been concentrated on investigations involving the elements of lead and sulphur. Two major projects have been completed and other large-scale investigations are underway. A detailed study of the sulphur isotope distribution at Yellowknife, N.W.T., has revealed striking relationships between sulphur in the ore bodies and in the country rock. The lead isotope distribution in the Sullivan Mine, Kimberly, B.C., has been found to be surprisingly uniform and age studies have indicated that the ore is much older than previously assumed.

BOOK REVIEWS

FIELD GEOLOGY, 6th Ed., by Frederic H. Lahee. 926 pages. McGraw-Hill Book Company, Inc., New York 36, N.Y., 1961. \$10.75.

FIELD GEOLOGY by Lahee has been an outstandingly successful book for nearly forty-five years. It is perhaps the foremost field manual among works on field geological techniques. In this, the sixth edition, every phase of geology that is treated in the book has been modernized. There are many concise definitions of new terms. Additional Topics and techniques are discussed, including such features as Tectonic Correlation of Sediments, Distortion and Displacement in Aerial Photographs, Induction Logging, Dip-Meter Surveying, and Electronic Survey Methods. Part of the chapter on geophysics dealing with the use of the gravimeter has been almost completely re-written. There are 16 new illustrations and 65 new references in the bibliography. Without a doubt, the revisions and additions to this new edition will insure the continued success of this essential field manual.

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DESCRIPTIVE PALAEOCLIMATOLOGY, ed. A. E. M. Nairn. 380 pages. Interscience Publishers, Inc., 250 Fifth Ave., New York 1, N.Y., 1961. \$11.00.

This is a much-needed summary of recently-developed techniques and recently-achieved results in the field of palaeoclimatology, a rapidly expanding subject for investigation in the general field of earth sciences.

Following an introductory chapter entitled "The Scope of Palaeoclimatology" by the editor, the following subjects are treated:

Fundamentals of Climate, by H. H. Lamb

The Palaeoclimatological Significance of Desert Sandstone, by N. D. Opdyke

Palaeoclimatic Significance of Evaporites, by Robert Green

Climatic Significance of Red Beds, by F. B. Van Houten

Geological Evidence of Cold Climate, by R. F. Flint

The Application of Geophysics to Palaeoclimatology, by A. E. M. Nairn and N. Thorley

Palaeozoological Evidence of Climate - (1) Vertebrates, by A. S. Romer

Palaeozoological Evidence of Climate - (2) Invertebrates, by G. Y. Craig

Palaeobotanical Evidence of Climate, by R. Kar'usel

The Climatic History of Europe and North America, by M. Schwarzbach

The Climatic History of the Far East, by Teiichi Kobayashi and Tokio Shikama

The Palaeoclimatology of Gondwanaland during the Palaeozoic and Mesozoic Eras, by L. C. King

The Climates of Gondwanaland in Kainozoic Times, by E. D. Gill

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PUBLICATIONS RECEIVED

- ANDERS, EDWARD. Extinct Radioactivity and the Prehistory of the Solar System. *Zeit. Naturfor.*, 16a, 520-521, 1961.
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- BANNO, S. and K. KANEHIRA. Sulfide and Oxide Minerals in Schists of the Sanbagawa and Central Abukuma Metamorphic Terranes. *Jap. Jour. Geol. and Geogr.*, XXXII, (2), 331-348, 1961.
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Mine, Iwate Prefecture, Jap. Mineral. Jour., 3, (1), 30-41, 1960.

CALENDAR

Dec.

- 26-31 AAAS, ann., Denver, Colo. (R.L. Taylor, AAAS, 1515 Massachusetts Ave. NW, Washington 5, D.C.)
- 27-29 Amer. Geophysical Union, 1st western natl., Los Angeles, Calif. (A.N. Sayre, U.S. Geological Survey, Washington 25, D.C.)
- 28-29 Amer. Chem. Soc., Div. of Industrial and Engr. Chem., Newark, Del. (Scientific Liaison Office, Natl. Res. Council, Sussex Dr., Ottawa, Canada)

Jan.

- 15-17 AIME, Minnesota Sect., ann., Univ. of Minn., 23rd Ann. Mining Symposium, Hotel Duluth, Duluth

Feb.

- 18-22 AIME, ann., Statler-Hilton and Astor Hotels, New York, N.Y.

Mar.

- 15-17 Optical Soc. of Amer., Washington, D.C.
- 20-29 Amer. Chem. Soc., 141st mtg., Washington, D.C.
- 26-29 AAPG-SEPM, ann., jointly with AAPG-SEPM-SEG Pacific Sections, Civic Aud., San Francisco; Fairmont Hotel, hotel headquarters

Apr.

- 5-6 ASME-SAM Management Engr. Conf., Statler-Hilton Hotel, New York, N.Y.
- 9-11 45th Natl. Open Hearth and Blast Furnace, Coke Oven and Raw Materials Conf., sponsored by The Metallurgical Soc. of AIME, Sheraton-Cadillac Hotel, Detroit, Mich.
- 9-13 ASME Metals Engr. Conf., Sheraton Cleveland Hotel, Cleveland, Ohio
- 12-14 AIME Pacific Southwest Mineral Indust. Conf., Palace Hotel, San Francisco, Calif.

ION EXCHANGE COLUMN

CO-EDITOR APPOINTED

Beginning with the first number of 1962 (February), The Geochemical News will have as its co-editor Dr. William C. Kelly, Assistant Professor of Geology, Department of Geology and Mineralogy, The University of Michigan, Ann Arbor, Michigan. Dr. Kelly, who received his PhD in geology from Columbia University in 1954, joined the staff of the Department of Geology at The University of Michigan in 1956. He has been a member of The Geochemical Society since 1957. His chief scientific interests are the fields of geochemistry, economic geology, and ore microscopy.

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NEW APPOINTMENTS AT THE PENNSYLVANIA STATE UNIVERSITY

Lauren A. Wright, formerly supervising mining geologist with the California Division of Mines, has joined the faculty as professor of geology and head of the Department of Geology. In the latter capacity he succeeds Frank M. Swartz, who has been appointed research professor of paleontology. Peter J. Wyllie, returning to Penn State from Leeds University, joins the Department of Mineralogy and Petrology as associate professor of petrology. Richard R. Parizek has come from the University of Illinois as assistant professor of geology, and will activate a program of instruction and research in ground-water geology. Scheduled to arrive early in 1962 are Cecil E. Tilley of the University of Cambridge, who will serve as visiting professor of petrology, and William G. Chaloner of University College, London University, who will serve as visiting professor of palynology.

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An informative summary of the properties, uses, and technology of cesium, present and projected, appears on pp. 18-29 of the publication of the Dow Chemical Company, the Dow Diamond in the Summer 1961 number.

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Geologists interested in mineral deposits and mineral economics of the CENTO countries (Turkey, Iran, and Pakistan) will find the report on the Conference on Minerals, Ankara, Turkey, December 1959, a useful reference. It is printed by the Mineral Research and Exploration Institute of Turkey, 1961.

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The Clay Minerals Group of the Mineralogical Society (England) met November 3rd in the apartments of the Geological Society of London, Burlington House, London W. 1. The program of papers was as follows:

A clay mineral from Stjernoy, North Norway.
By Mr. D. A. Holdridge

Weathering of some iron-bearing minerals.
By Dr. R. F. Youell

Semi-microdetermination of iron monosulphide in shales.
By Dr. S. Neglia and R. L. Favretto

Charge densities and heats of immersion of some clay minerals.
By Dr. R. Greene-Kelly

"Al-Chlorite," a new dioctahedral mineral of the chlorite group.
By Dr. A. Müller

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

The Institute of Physics and the Physical Society (England), X-ray Analysis Group announces an autumn conference entitled "Imperfections in Crystals."

From Geochemistry (Translation) 1956, No. 8, p. 738:

"The chemical phase of our work has been carried out by the analysis of the Chair of Mineralogy of the Moscow State University ..."

Pseunami -- Hawaiiin name for a type of lava flow.

Doctrine of Uniformitarianism: Geological changes throughout the earth take place in a steady state in the long run.

Four agents of metamorphism: heat, stress, pressure, lubrication.

Four agents of sedimentary deposition: wind, water, diatoms, radioluria.

Variations on the igneous rock theme: Bassalt, poryphory andesite, porophery, periodotite, perritotite, basalt phrophy.

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E. Wm. Heinrich
Editor

Department of Geology and Mineralogy
The University of Michigan
Ann Arbor, Michigan