The Geochemical News

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THE GEOCHEMICAL SOCIETY COMMITTEES FOR 1961

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REPORT OF THE 1959-1960 STANDARDS COMMITTEE OF THE GEOCHEMICAL SOCIETY

The Standards Committee, consisting of George Switzer, Michael Fleischer, Felix Chayes, George Tilton, Lorin Stieff, John Maxwell, Gunnar Kullerud, Frank Schairer and A. Van Valkenburg, had four meetings during the past year. The major accomplishments of the committee are as follows:

1. Rejected the Mount Desert Island Granite as a possible reference sample to supplement G-1. Felix Chayes, after considerable study of this rock, concluded that the granite did not meet the qualifications of a good reference sample. The committee then agreed that a second sample of the Westerly Granite similar to G-1 should be obtained. Negotiations are now in progress for getting an adequate sample.

2. The Standards Committee, in cooperation with the National Bureau of Standards, is now undertaking the task of obtaining a dolomite rock for possible use as a reference standard. The rock under consideration is a dolomite from the Ledger formation of Southeast Pennsylvania.

3. 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, sponsored by the Geochemical Commission of the UPAC and The Geochemical Society, was attended by over one hundred representatives from various parts of the world.

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 naturally occurring organic compounds. The chairman pointed out that the Standards Committee 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 Explorations, Box 69, Dodoma, Tanganyika.

Many letters were received from those who could not attend the symposium, expressing ideas on standards and on 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 Geochimica 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

ROCK STANDARDS PROGRAM

Dr. R. P. Hollingworth of the Geological Survey of Canada has a series of fluorine rock standards that he would like to make available to those interested in participating in a rock standards program. The rocks are all typical members of the common classes of rocks, nine from localities either described (numbers 1-7) or to be described (numbers 8 and 9) in the literature. The samples are:

1. Quartz monzonite - Shap granite quarry, Westmorland, England
2. Tourmaline granite - quarry near Rame, Cornwall, England
3. Nepheline syenite - near Grønnedal, Greenland
4. Tonalite - near Strontian, Scotland
5. Diabase (Whin Sill) - quarry near Holwick, Yorkshire, England
6. Eucrite - near Achnaha, Ardnamurchan Peninsula, Scotland
7. Migmatite - Pont de Menat, Massif Central, France
8. Schist - Clifden district, County Galway, Ireland
9. Hornfels - Clifden district, County Galway, Ireland
10. Marine shale - core sample taken from near Hexam, Northumberland, England

Preparation Procedure. From 600 to 800 grams of powdered sample of each rock were prepared by accepted procedure. For the first nine rocks thin sections were prepared and all the constituent minerals were identified. Point count data were also obtained for the first eight rocks. The marine shale, which is carbonaceous and pyritiferous, has not been examined in detail.

Information for Participants. Analysts interested in joining the program should write Dr. Richard P. Hollingworth, Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario, Canada. He will send descriptions of the samples, including locality, applicable literature references, and mineral identification and point count data together with 15 to 20 grams of each sample should they wish to join right away, or without the samples should they choose to examine the data before deciding.

Information Expected. Participants are asked to make available details of the procedure(s) they have employed (if not published). There will be a free exchange of all data; Dr. Hollingworth will act as a clearing house for this. On submitting his results, each will get those of the others. Data may be published.

Status of the Program. To date the following have participated:

Analyst	Method
R.P. Hollingworth	Anal. Chem., 29, 1130 (1957) Anal. Chem., 27, 918 (1955)
H.N. Wilson Imperial Chemical Industries England	Chemical (Na_2CO_3 fusion) Chemical (Na_2O_2 decomposition) Anal. Chem., 30, 1546 (1958)
L.F. Rader Denver Rock Analysis Lab. U.S. Geological Survey	Chemical (Na_2CO_3 fusion)
V.C. Smith Denver Rock Analysis Lab. U.S. Geological Survey	Spectrographic
J.A. Maxwell Geological Survey of Canada Ottawa	U.S. Bur. Mines Rept. Inv., No. 5158
O.C. Ingamells Pennsylvania State University University Park, Pa.	Chemical (to be published)

The above group will probably co-author a paper to be submitted in about six months' time to Geochimica et Cosmochimica Acta. By "chemical" above is meant Berzelius methods and the like.

Further Work. Dr. Hollingworth intends to analyze these rocks by both "classical" and micro methods for the major elements. He also will look for traces by colorimetric and spectrographic methods. Participants may expect, then, to have, albeit two to three years from now, values for these elements, too.

Limitation. The stocks of each sample are not great (600 to 800 grams of each), so Dr. Hollingworth thinks it wise to limit the number of participants to a maximum of twenty. If that number do join, they must realize that 15 to 20 grams of each sample is all they can expect to get.

SYMPOSIUM ON "PROBLEMS OF THE ORIGIN OF POSTMAGMATIC ORE DEPOSITION (WITH SPECIAL REFERENCE TO THE GEOCHEMISTRY OF ORE VEINS)"

In 1963 a symposium entitled "Problems of the origin of postmagmatic ore deposition (with special reference to the geochemistry of ore veins)" will be held in Prague, Czechoslovakia. The purpose of this symposium is to discuss some of the important questions on postmagmatic ore deposition. The following questions have been selected for discussion:

1. Problems concerning the origin of primary zoning in ore veins, ore deposits, and larger units. Discussion on the following questions will be especially welcomed:

a) Criteria that prove polyascendant* (pulsation) zoning. Causes of the polyascendant origin of hydrothermal deposits.

b) Criteria that prove monoascendant origin and monoascendant zoning*.

Criteria that prove different minerals in ore veins were deposited from the same solution ascending without interruption.

c) Evolution of chemical composition of ore-bearing solutions from the same source.

d) Other contributions on questions of zoning.

2. Criteria that solve the manner of the transport of metals in ore-bearing solutions and comments on the existing views.

3. Reasons for or against distinguishing the pneumatolytical phase in the classification of postmagmatic processes.

4. Criteria for the recognition of metacrysts.

5. Role of selective replacement in hypogene ore deposition.

Contributions in one of the Congress languages, dealing separately with the individual questions, each of which should not exceed five typewritten pages, are welcomed. The number of figures or plates should not exceed two pages. Manuscripts ready for printing should reach the General Secretary of the Symposium, M. Štemprok, Geological Survey of Czechoslovakia, Malostránské nám. 19, Praha 1, Czechoslovakia, before December 15, 1961.

The contributions received will be published as a separate volume available several months before the symposium takes place.

J. Kutina
Faculty of Natural Sciences
Charles University
Prague

M. Vaněček
Geological Survey of Czechoslovakia
Prague

INTERNATIONAL ASSOCIATION OF VOLCANOLOGY

As was announced at the Helsinki meetings, the International Association of Volcanology (IAV) has organized a symposium on "ignimbrites and hyaloclastites" at Catania (Sicily, Italy) from September 15 to 24, 1961. The symposium will consist partly of field discussions and partly of communications presented in Catania.

Communications to the symposium must be limited to the subjects of "ignimbrites and hyaloclastites". Summaries (in English or in French) should be sent to the General Secretary of IAV before July 15, 1961. Contributors who desire distribution of their communications are asked to send sixty mimeographed or multigraphed copies before the opening of the symposium.

Forms to be filled out are obtainable from - and should be returned before June 15, 1961 to - Professor Francesco Penta, General Secretary of IAV, Istituto di Geologia Applicata, Via Eudossiana, 18, Rome, Italy. Final programs and information will be sent later to those who are willing to participate in the meeting and who have filled out the forms.

*See Econ. Geol. 52, pp. 316-319, 1957.

INTERNATIONAL INDIAN OCEAN EXPEDITION

During the years 1961 to 1964 there will be an intensified international investigation of the Indian Ocean. Conceived by the Special Committee on Oceanic Research of the International Council of Scientific Unions, at least eleven nations will participate with their ships and scientists. A total of at least ten ship-years will be contributed by participants and a total track of 180,000 miles will be covered.

The expedition will study the physical, chemical, geological, biological, and meteorological features of the Indian Ocean and problems that are specifically related to that region or can be studied more efficiently there than anywhere else.

The national programs are being drawn up by the national committees of SCOR. The national committee for the United States is the Committee on Oceanography of the National Academy of Sciences, National Research Council. The Committee on Oceanography has organized a series of special panels on biology, geology, geophysics, etcetera in order to help plan the United States program. Emphasis is being placed on sound scientific problems and investigations which require extensive international cooperation. The national programs are being unified under the general guidance of the SCOR Indian Ocean Working Group (Dr. George Deacon, Great Britain, chairman). The details of the cooperative effort are being worked out by Dr. Robert Snider, 30 East 40th Street, New York 16, New York, coordinator for the expedition.

The major portion of the United States program will be carried out by the Woods Hole Oceanographic Institution, the Scripps Institution of Oceanography, and the Lamont Geological Observatory. All have made plans for their ship operations and the participation of scientists. Several governmental agencies will also participate actively in the expedition and/or the study of the collected samples.

Support is being sought from the National Science Foundation, Office of Naval Research, governmental and private agencies.

A later announcement will discuss the geochemical and related programs.

F.C. Koczy

REPORT ON GEOCHEMISTRY DISCUSSION GROUP

Carleton University, Ottawa, Canada, 13 March 1961

SOME ASPECTS OF THE SIGNIFICANCE OF CHEMICAL COMPOSITIONS OF COEXISTING MINERALS, by Dr. John M. Moore, Jr., research fellow, Carleton University.

Abstract

The possibility that many mineral assemblages of metamorphic, igneous, and even sedimentary rocks have attained chemical equilibrium at some time in their history, and that these equilibria have been preserved metastably to the present, permits study of these rocks from a basis of physical chemistry. Minerals of variable composition (natural solid solutions) may be particularly sensitive indicators of absence or attainment of equilibrium. It is thus the composition of these solutions, and not the bulk chemical composition of the rock, which is most informative. The nature of the mineral assemblage is a function of bulk composition and the physical environment; the compositions of solid solutions in a given assemblage may or may not be dependent on bulk composition. In attempting to draw conclusions about the physical environment from chemical data, it is thus important to evaluate correctly the variables, both physical and chemical, which are pertinent to the system under study. Data should be collected so as to provide a maximum of information about the system.

Various methods of graphical representation (phase diagrams) provide a means of visualizing the system and predicting the direction of chemical reaction in various geologic processes.

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SOME ASPECTS OF THE GEOCHEMISTRY OF FLUORINE IN METAMORPHIC ROCKS, by Dr. R. P. Hollingworth, post-doctorate fellow, Geological Survey.

Abstract

The method of determining fluoride in the rocks studied is described. Results reported by five participants using a number of methods in an interlaboratory standardization program are examined. The samples analyzed are mainly regionally metamorphosed rocks plus some injection gneisses and hornfelses. The abundance of fluoride in these metamorphic rocks is considered in relation to a number of variables. The frequency distribution of fluoride in 345 metamorphic rocks is discussed; it is suggested that phenomenological classifications of the rocks are useful in understanding the nature of the frequency distribution of this minor element.

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BOOK REVIEWS

FROM THEORY TO PRACTICE IN SOIL MECHANICS, selections from the writings of Karl Terzaghi, edited by L. Bjerrum, A. Casagrande, R. B. Peck, and A. W. Skempton. 425 pages, John Wiley and Sons, Inc., New York, New York, 1960. $12.00.

Each section of this book is pointed toward a particular aspect of Karl Terzaghi, a man who both founded and nurtured a new phase of engineering science. In Part I the four editors tell something of Terzaghi, the man - his life, his achievements, and his method of working. Part II includes four of Terzaghi's papers which outline the aim and scope of soil mechanics as he envisions the field. As an example of the areas within the field which have been particularly effected by Terzaghi's investigations, Part III includes seventeen representative papers running the gamut from one dealing with the landforms and underground drainage of a part of Yugoslavia to several dealing with fundamental studies of the shearing strength of soils. Some of these were translated especially for this volume. The five professional reports included in Part IV serve to give some further idea of Terzaghi, the professional engineer. Here the zest with which he tackled the most ticklish problem, even the joy he felt when faced with a problem that required knowledge of more than mere theory, becomes apparent. It goes almost without saying that Part V, a bibliographic listing of his 256 published papers arranged in chronological order, serves not only as an excellent bibliography of the field of soil mechanics but also as an outline of the history of that phase of engineering.

The book thus serves several purposes - as a fine tribute to a deserving scientist, as a rather unique biography of the man, and as a reference book for the field he serves so well. The reviewer, who was a teaching fellow under Terzaghi in the rock and mineral laboratory sessions for his engineering geology course at Harvard and who met him only briefly and on relatively few occasions, can vouch for the genuineness of the man so aptly portrayed in the book.

Donald F. Eschman
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TABLES AND NOMOGRAMS OF HYDROCHEMICAL ANALYSIS, by I. Yu Sokolov. 85 pages, 65 tables, translated from Russian, Consultants Bureau Enterprises, Inc., 227 West 17th Street, New York 11, N.Y. $4.35.

This book consists entirely of tables and brief explanations, either in the form of the introduction or of short passages of text accompanying some of the tables. These tables provide a convenient means of converting analyses of ground water from one form into another for all of the ions most commonly found in natural waters; for example, milligrams to milligram equivalents and vice versa. The concentrations tabulated cover the range normally found in ground waters but could easily be adapted for use at other concentrations. In addition, nomograms for calculating per cent equivalents and for calculating pH as well as tables or graphs for estimating other quantities of interest in ground water studies are given.

Paul L. Cloke
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METHODS IN GEOCHEMISTRY, ed. A.A. Smales and L.R. Wagner. 464 pages, 85 figures, 18 plates. Interscience Publishers, New York, 1960. $13.50.

This book consists of a short introductory chapter by the editors followed by ten chapters by various authors on sampling, analytical, and chemical methods used in geochemistry. The coverage provides a good summary and source of literature references for the geochemist. For the average geologist who is interested in progress in geochemistry and in the results of isotope, radioactivation, and trace-element studies, this book provides, in general, a clear explanation of the principles, difficulties, applications, and limitations of these new methods. Unfortunately, a few chapters presuppose a chemical background which most geologists probably do not have, and these chapters may, therefore, be incomprehensible to some. Most of this deficiency is compensated by excellent coverage of the same subject matter in other chapters.

Paul L. Cloke

STRUCTURAL GEOLOGY OF CANADIAN ORE DEPOSITS, Volume II. 524 pages. Mercury Press Company, Montreal, Quebec, 1957.

In 1948 the Canadian Institute of Mining and Metallurgy commemorated its 50th year and published a jubilee volume called Structural Geology of Canadian Ore Deposits. This second volume of the same title commemorates the 6th Commonwealth Mining and Metallurgical Congress held in Canada in 1957. In the decade between the two volumes there has been a remarkable development of Canadian ore deposits. The second volume has three objectives: (1) to cover as many as possible of the mines and districts that were actively developed since 1948; (2) to describe certain deposits neglected in the 1948 volume; and (3) to bring up to date descriptions of deposits for which new information was available. There are 62 papers in the work involving some 73 contributors. The work is divided into five chapters, each embracing a major region of Canada and most of the chapters have several parts.

Without a doubt this work will receive the same welcome that was accorded Volume I, which proved to be a best seller. The standard of presentation continues to be very high and the book contains a great deal of information on ore deposits for which there are few general references elsewhere in the literature.

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THE GEOLOGY OF CANADIAN INDUSTRIAL MINERAL DEPOSITS. 247 pages. Stovel-Advocate Press Limited, Winnipeg, Canada, 1957.

This volume, which presents information on the geology of most of the major industrial deposits that were being exploited in 1956 in Canada, also appeared in connection with the 6th Commonwealth Mining and Metallurgical Congress of 1957. The work consists of 67 papers on the following non-metallic minerals and mineral aggregates:

Actinolite	Fluorspar	Potash
Apatite	Garnet	Pyrophyllite
Arsenic	Granite	Quartz Crystals
Asbestos	Graphite	Salt
Barite	Gypsum	Sandstone and Quartz
Bentonite	Kyanite	Sodium Carbonate
Brucite	Limestone	Sodium Sulphate
Beryl	Lithium Minerals	Strontium
Chromite	Magnesite	Sulphur
Corundum	Magnesium Sulphate	Talc and Soapstone
Clay	Mica	Vermiculite
Diatomite	Nepheline Syenite	Witherite
Feldspar	Ochre	

Again, the work will undoubtedly prove to be a major reference, embodying a great deal of new information on deposits that have not been described elsewhere and giving new information on deposits whose descriptions have been outdated.

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PALEOGEOLOGIC MAPS, by A.I. Levorsen. 174 pages, 106 figures, 61 references and selected readings. W.H. Freeman and Company, California, 1960.

This short volume with its abundant illustrations assembles a wealth of information on the construction and use of paleogeologic maps. The imaginative approach taken should provide any reader, whether a student or practicing geologist, with a much better appreciation of the value of such maps in the understanding of geologic history. A brief introduction on the "kit of tools" and terminology needed is followed by chapters on the sources of data, preparation and interpretation of such maps, and their use in the solution of several kinds of geologic problems including: (1) the time an event occurred, such as the time of deformation, the time of oil and gas migration, the time of possible paleohydrodynamic gradients; (2) the extent and location of an area affected by an early episode, such as the location of the deformation, the location of the source of post-unconformity sediments, the location of wedge-belts of strata, or the pattern of the geology of an area before rupture; and (3) the origin of phenomena; i.e., whether a wedge-edge of sediments is the result of deposition or truncation or of both.

There follow specific examples of the uses of such maps, first in selected foreign and domestic oil fields where the extent of subsurface stratigraphic data is considerable, then in regional areas throughout the world, and finally the application of paleogeologic maps to the understanding of the history of continental areas, the whole world, and problems such as continental drift.

In addition to its value to professional geologists this book should prove extremely useful as a reference in a variety of advanced college geology courses.

John A. Dorr, Jr.
Department of Geology
The University of Michigan

THE PRECAMBRIAN GEOLOGY AND GEOCHRONOLOGY OF MINNESOTA, by Samuel S. Goldich, Alfred O. Nier, Halfdan Baadsgaard, John H. Hoffman, and Harold W. Krueger. 193 pages. The University of Minnesota Press, 1961.

The reviewer agrees with the statement in the Foreword that "This bulletin is an outstanding example of the cooperation of several scientists and scientific organizations." The project was made possible by grants from the National Science Foundation. It represents one of the first major efforts by a state geological survey to bring together new research results on the dating of rocks within the state's borders and uses this information to develop a classification of the Precambrian rocks of Minnesota. Doubtless it will long continue to set an example for works of this type.

In addition to describing the age determination methods employed (Potassium-Argon and Rubidium-Strontium), the bulletin describes the Precambrian rocks of the various sections of Minnesota and gives ages for many of them. The final sections correlate the petrography, stratigraphy, and age results.

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CALENDAR

July

30-Aug. 4	Amer. Crystallographic Assoc., Boulder, Colo.

Aug.

21-Sept. 6	Pacific Science Congress, 10th, Honolulu, Hawaii. Write: Secretary General, 10th Pacific Science Congress, Bishop Museum, Honolulu 7, Hawaii.
21-25	Diamond Drilling Symposium, Broken Hill branch, Australasian Institute of Mining and Metallurgy, Broken Hill, N.S.W.

Sept.

11-14	American Mining Congress annual convention, Seattle, Wash.

Oct.

2- 3	Joint meeting, SME Industrial Minerals Div. of AIME--CIM, Ottawa, Canada.
8-11	AIME: Soc. of Petr. Engrs., Dallas, Texas.
14-18	National Clay Conf., University of Texas, Austin. Write: E. Joseph Weiss re program or papers and Stephen E. Clabaugh re field trips, both at Univ. of Texas.
18-21	AAPG: Mid-Cont., Amarillo, Texas.
25-27	Gulf Coast Assoc. of Geol. Socs., San Antonio, Texas.

ION EXCHANGE COLUMN

Among some of the noteworthy publications that have crossed the editor's desk recently are the following:

A small colorful list of publications called simply Bulletin. It is in English and lists the publications of the publishing house of the Czechoslovak Academy of Sciences and those of the publishing house of the Slovak Academy of Sciences. Publications in the earth sciences are included in the listings.

The Annals of the Public Geological Institute of Hungary, Vol. 49, Fasc. 1, 1960. This volume in three languages - Russian, French, and German - presents the results of the conference on the Mesozoic held in Budapest, September 15-23, 1959 and attended by 170 Hungarian geologists and 70 foreign geologists.

A major reference work is that released recently by the Colombian Ministry of Mines and Petrology, National Geological Institute, entitled in translation from the Spanish, Compilation of Official Geological Studies in Colombia, Vol. 9. This is a bibliography of references to geological studies in Colombia.

Annual Report of the Bureau of Mines of the Republic of the Philippines for 1959-1960 contains a great deal of information on mining activities in the Philippines including data on copper, manganese, chromite, iron, and a variety of non-metallic mineral deposits.

The trade journal called Research Laboratory Bulletin, winter 1961 issue, published by General Electric, has an interesting and informative series of articles on superconductivity.

Occasionally the editor hears from members of The Geochemical Society who have gone far afield. Recently Allen S. Rogers, formerly with the Research Division of Phillips Petroleum Company in Oklahoma, wrote that he has joined the Department of Geology at the University College of Addis Ababain, Ethiopia, where, he says, "We have a two-man staff plus one more, we hope, and eight potential geologists who should start graduating in about two years. I would be happy to act as contact for this part of the world for anyone in the Society--rock mineral samples, volcanics aplenty."

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Selected Daffynition from our Unabashed Fictionary

Lamprophyre - a type of eel that they are trying to kill in the Great Lakes.

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This issue goes to press just as the academic year has closed. The next issue is planned to appear in early September.

E. Wm. Heinrich
Editor

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