PROCEEDINGS OF THE EIGHTH ANNUAL MEETING OF THE MINERALOGICAL SOCIETY OF AMERICA

FRANK R. VAN HORN, *Secretary.*

The Mineralogical Society of America held its eighth annual meeting on December 29, 30, and 31, 1927, in conjunction with the Geological Society of America at Cleveland, Ohio, as guests of Case School of Applied Science and Western Reserve University. On Thursday, December 29, at 2:00 P.M. President A. F. Rogers called the regular annual meeting to order in the Geology-Mineralogy Lecture Room of Case Main Building. On motion of the Secretary the reading of the minutes of the last annual meeting was dispensed with, in view of the fact that they have been printed on pages 71–83 of Volume 12 (Number 3) of THE AMERICAN MINERALOGIST.

ELECTION OF OFFICERS AND FELLOWS FOR 1927

The Secretary announced that 142 ballots had been cast for the officers as nominated by the Council. Of these 139 were unanimous and three were negative in part. For fellows there was an unanimous vote of 61 ballots in the affirmative. All officers and fellows were declared elected.

The officers elected for 1928 are the following:

President: Esper S. Larsen, Harvard University, Cambridge, Mass.
Vice-President: Lazard Cahn, Colorado Springs, Colorado.
Secretary: Frank R. Van Horn, Case School of Applied Science, Cleveland, Ohio.
Treasurer: Alexander H. Phillips, Princeton University, Princeton, New Jersey.
Editor: Walter F. Hunt, University of Michigan, Ann Arbor, Michigan.
Councilor 1928–1931: Ellis Thompson, University of Toronto, Toronto, Canada.

The fellows elected follow:

Arthur Hutchinson, University of Cambridge, Cambridge, England.
Robert L. Parker, Swiss Federal Technical University, Zurich, Switzerland.
Lewis S. Ramsdell, University of Michigan, Ann Arbor, Michigan.
Hans Schneiderhoehn, University of Freiburg, Baden, Germany.
Chester B. Slawson, University of Michigan, Ann Arbor, Michigan.
A. J. Walcott, Northwestern University, Evanston, Illinois.

REPORT OF THE SECRETARY FOR 1927

To the Council of the Mineralogical Society of America: The Secretary herewith begs to report that the roll of the Society now comprises 105 fellows and 218 members, a gain of 2 fellows and 13 members for the year notwithstanding the fact that 2 fellows and 14 members have been dropped from the mailing list for nonpayment of dues. One honorary fellow, Professor Paul von Groth, and one fellow, George Vaux, Jr., have died. Brief accounts of their careers appear in this issue of the Journal. Three members, Professor José J. Bravo, J. H. Ten Eyck Burr, and Henry Fair, have also died. In addition to the 323 fellows and members, there are 163 subscribers, a gain of 12 for the year although 8 were dropped for nonpayment. A total of 476 paid copies of the Journal are mailed monthly, an increase of 17 over last year. Actually, during the past year, 5 fellows, 39 members and 8 subscribers were added, but the net gain was not large, due to deaths, resignations, and non-payment of dues and subscriptions.

Respectfully submitted,
FRANK R. VAN HORN, *Secretary.*

REPORT OF THE TREASURER FOR 1927

The Treasurer read his report, and on motion it was accepted and ordered filed. On motion an auditing committee composed of non-members of the Council was appointed by the President. This committee consisted of Charles Palache and R. J. Colony, and later reported to the Secretary that they found the books of the Treasurer correct.

To the Council of the Mineralogical Society of America: Your treasurer herewith submits his annual report for the year ending November 30, 1927:

Receipts

Cash on hand December 1, 1926	$2,704.37	
Dues and subscriptions	1,705.62	
Advertisements	279.25	
Sale of back numbers	508.69	
Interest on bank deposits and Endowment	2,338.92	
Miscellaneous	23.47	
		$7,560.32

Disbursements

Printing and distribution of the Journal	$2,859.28	
Printing of Vols. 1–5 and Decennial Index	1,047.82	
Miscellaneous printing, stationery, and postage	28.82	
To the Editor	375.00	
Miscellaneous	38.79	
	$4,349.71	
Balance in Princeton Bank & Trust Co., Nov. 30, 1927	3,210.61	$7,560.32
The Endowment consists of 45 one thousand dollar bonds of the City and County of Honolulu	$45,000.00	
4 Liberty Bonds of $100 each 4th 4-¼%	400.00	
3 $100 bonds of the Great Northern R.R., 5-½% Gold	300.00	
	$45,700.00	

Respectfully submitted,
Alexander H. Phillips, *Treasurer.*

REPORT OF THE EDITOR FOR 1927

The report was read by the Editor, and on motion it was accepted and ordered filed.

To the Council of The Mineralogical Society of America: In the Editor's report a year ago several recommendations were made to the Council which seemed to represent very desirable undertakings. These recommendations included the preparation of an author-subject decennial index covering the period 1916–1925 and the printing, by photographic process, of the first five volumes of the Journal. The Council very generously authorized the necessary expenditures and the current year has seen these two projects completed.

The need for reprinting these early volumes had been felt for some time and the sale of these, and subsequent issues which the early volumes now make possible, will more than repay in a short time the original expenditure. This statement is based upon an item in the treasurer's present report which shows a sale of back numbers during the year of over $500 compared with $250 of a year ago. This is a very creditable showing considering that the reprinted volumes were not available for distribution until June and that the treasurer's report does not include sales made during the month of December.

The decennial index is moving more slowly. An edition of 600 was printed to insure an ample supply for both present and future needs as it seems reasonable to believe that there will always be a limited but steady demand for such an index from those using the Journal for reference purposes.

In attempting an analysis of the Journal for the current year we find that the volume for 1927 contains approximately 450 pages of text proper, a volume which in size has been equalled but once in the history of the Society. One special number containing ten contributions from the Department of Mineralogy & Petrography of Harvard University contributed 90 pages towards this total. As has been the custom in former years the Society's share of the cost of this special number was approximately the same as for a normal issue. The readers were thus enabled to secure an unusually large and attractive volume without undue strain being placed upon the treasury. It is quite possible that the issues for the coming year will again include at least one special number.

The current issue contains 60 *leading* articles, or an average of five articles per month, and represents contributions received from 27 different Universities and research Bureaus. The number of leading articles establishes a new record and is especially gratifying as it includes nine manuscripts sent in from outside of the States—one each from Germany, Bohemia and Italy and six from Canada—clearly indicating a growing cosmopolitan interest in the Society's publication.

Of the 60 leading articles, 7 recorded for the first time descriptions of new mineral species; 10 described famous mineral localities; 29 called attention to new data on established species and 14 consisted of addresses, memorials and articles of a miscellaneous character. The series of mineral locality articles, which was begun over a year ago, should appeal particularly to our friends the collectors and will be continued from time to time as suitable material becomes available. Issues now in press contain brief descriptions of the mines at the Falls of French Creek, Pennsylvania, and the minerals in the Black Hills district, South Dakota.

The 60 leading articles of the present year occupied 359 pages or 81.5 per cent of the total space, while 14 book reviews, 20 reports of the proceedings of societies, 45 abstracted accounts of new mineral names and 59 other items of general interest, including brief discussions, filled the remaining 81 pages or 18.5 per cent of the space of the Journal.

In regard to plans for the coming year, inasmuch as two items on this year's list—printing of volumes 1–5 and the index—are not recurrent expenditures, the saving here would permit further expansion of the Journal if the manuscripts are forth coming. Letters sent out each year seeking information as to the location of desirable material is proof that difficulty is still experienced in completing well balanced issues during the summer months. As very little material is received during the vacation period the stock on hand, at times, becomes uncomfortably low.

The only solution seems to be to increase the reserve supply sufficiently during the spring and early summer to carry the Journal over this lean period. May I suggest, therefore, that special effort be made to complete all unfinished manuscripts and that they be turned in before leaving for your summer's work.

One other matter the Council might well consider although no definite action need be taken at this time. Frequently inquiries are received asking when the present policy of the Society would be changed from one granting contributors 25 complete issues of the Journal to one of issuing a limited number of reprints instead. The present system is less expensive to the Society but less convenient to the contributor who maintains an exchange list. No change in the present method is advocated until the amount of this extra expense can be fairly definitely stated. That is impossible at the present moment. I believe, however, that it is a desirable goal and should be reached as soon as possible.

The concluding table of contents summarizes the distribution of subject matter in volume 12.

DISTRIBUTION OF SUBJECT MATTER IN VOLUME 12

Subjects		*Articles*	*Pages*	*Percent. of total*
Original articles				
New mineral species	7			
Mineral locality articles	10			
New data on established species	29			
Memorials, addresses, etc.	14			
		60	359	81.5
Proceedings of societies		20	32½	18.5
Notes and news		59	23½	
Book reviews		14	11	
Abstracted accounts of new mineral names		45	14	
Total of text		198	440	100.0
Illustrations		119		
Covers, advertisements, index			92	
Total			532	

Respectfully submitted,
WALTER F. HUNT, *Editor.*

REPORT OF THE COMMITTEE ON NOMENCLATURE AND CLASSIFICATION OF MINERALS

W. F. Foshag reported that the committee had held no meetings during the past year. It was moved and carried that the committee be continued. This committee consists of H. S. Washington, W. F. Foshag, A. F. Rogers, T. L. Walker, E. T. Wherry, and E. S. Larsen.

REPORT OF THE COMMITTEE ON PRESERVATION OF TYPE MATERIAL

W. T. Schaller, chairman, reported progress. It was moved and carried to accept the report and continue the committee which consists of W. T. Schaller, W. F. Foshag, H. P. Whitlock, A. N. Winchell, and A. L. Parsons.

NEW BUSINESS

It was moved, seconded and carried that the Council send congratulations and the good wishes of the Society to Professor Victor Goldschmidt, Heidelberg, Germany, on his approaching 75th birthday.

The question of the number of reprints to be given the authors of leading articles was discussed. It was moved and carried that the Council consider some plan which would be more acceptable to the authors. It was suggested that 50 copies without covers would be more acceptable than the present policy.

Dr. T. L. Walker mentioned the possibility of having a Mineralogical Section at the next International Geological Congress.

MEMORIAL BIOGRAPHIES

A memorial sketch of Professor Paul von Groth was read by Edward H. Kraus. A memorial of George Vaux, Jr., written by S. G. Gordon was read by Frank R. Van Horn. A biography of Professor J. J. Bravo of Lima, Peru, was read by A. L. Parsons. Professor Bravo was nominated by the Council for fellowship but was killed in an automobile accident at Akron, Ohio, before his election. These memorials are printed in full in this issue.

PRESENTATION OF PAPERS

At 3:00 P.M., there being no further business, the Society proceeded to the reading of scientific papers. The papers presented with short abstracts follow.

K. K. LANDES: *Sequence of Mineralization in Keystone, South Dakota Pegmatites.* Pegmatites described are the Etta, Hugo, Peerless, and Ingersoll. In all of these the common minerals quartz, feldspar (orthoclase, microcline, or perthite), and muscovite crystallized out during an early magmatic phase. The less common minerals such as albite (variety cleavelandite), lepidolite, cassiterite, spodumene, columbite and many others replace the earlier minerals and were deposited by solutions from portions of the pegmatite still in process of consolidation. In some instances these hydrothermal minerals make definite veins through minerals deposited at an earlier stage.

J. T. LONSDALE: *Analcite from Brewster County, Texas.* This paper describes the occurrence of the first find of analcite from Texas. The crystal and optical properties of the mineral are given along with a chemical analysis.

A. N. WINCHELL: *The Isomorphous Relations of $MgSiO_3$ and $AlAlO_3$ in Silicates.* The evidence that $AlAlO_3$ may replace or "proxy for" $MgSiO_3$ in silicates is summarized with special reference to the case of muscovite.

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At 3:45 P.M. the Society adjourned to attend a joint session in the Physics Lecture Room, Case School of Applied Science, with the Geological Society of

America before which the presidential address of Professor Austin F. Rogers on "*The Natural History of the Silica Minerals*" was given. This paper is published in full in this number. Following this address with A. F. Rogers presiding, papers of a mineralogical and petrographical nature were presented. The joint session adjourned at 6: 00 P.M.

On Friday, December 30, at 9:15 A.M., President Rogers called the second session of the Society to order in the Geology-Mineralogy Lecture Room of the Case Main Building, and the reading of papers proceeded according to program.

G. AMINOFF and A. L. PARSONS: *Crystal Structure of Sperrylite.* Sperrylite has a simple cubic lattice. The length of the cube edge is 6.00Å. There are four molecules in the unit cube. Position of the atoms, Pt. 4b, As. 8h. This type of structure is the same as that found in pyrite. The value 5.40Å was determined for the cube edge of pyrite.

D. E. KERR-LAWSON (introduced by T. L. WALKER): *Pleochroic Haloes in Biotite.* Examination of pleochroic haloes in a biotite probably of Precambrian age, from near Murray Bay, Quebec, shows (1) that the haloes are distributed along the major and minor cleavage planes in such a way as to suggest that the minute radioactive nuclei were introduced after the crystallization of the biotite, (2) that a halo consists of a series of concentric spherical shells of different color density, (3) that the structure of a halo can only be properly seen where the thickness of the section is small compared with the diameter of the halo, (4) that the light-absorption curve obtained across a diameter of a thin halo-section by means of a microphotometer shows a remarkable similarity to the composite ionization curve for the eight alpha particles from the uranium series, and does not suggest that this curve might have been different in geologically ancient times, (5) where two haloes overlap, they interpenetrate in a curious way, so that where a light-colored shell of one halo cuts a dark colored shell of another, the dark shell is rendered lighter.

C. S. ROSS and P. F. KERR: *Optical and X-Ray Research on Clay Minerals.* A continuation of studies of the optical, chemical and x-ray properties of the clay minerals has tended to confirm the validity of some of the doubtful species, but it indicates that others have received more than one name. The work to date has tended to reduce the number of valid species. The following minerals have been investigated: kaolinite, halloysite, beidellite, nontronite, montmorillonite, anauxite, leverrierite, indianite, lenzenite, collyrite, glagerite, and saponite.

C. S. ROSS, E. V. SHANNON, and F. A. GONYER: *The Formation of Nickel Silicates by Base Exchange.* The weathering of the Webster, North Carolina, dunite has released the nickel that was originally a sparse constituent of the silicate minerals, principally the olivine, and is now concentrated in veins of nickel silicates. The mineralogy of the veins, however, is identical with that of non-nickel-bearing veins that are widely distributed in dunite and serpentine masses. The geological relations therefore indicate that few new minerals have been formed, but most of the nickel has been transferred from dunite to previously existing vein minerals by the process of base exchange during weathering. The possibility of base exchange is confirmed by experiment.

W. T. SCHALLER: *Occurrence of Kernite and Associated Borates.* An enormous quantity of kernite is present several hundred feet underground near Kramer, Mojave desert, Calif. Crystals measuring up to 6 by 3 feet, irregular masses, and veins occur in mud shales. Massive rock borax and several other borates are relatively sparingly present.

W. T. SCHALLER: *Probable Identity of Camsellite with Szaibelyite.* A comparison of the optical properties and analyses of these two minerals shows such similarity that they are probably identical.

W. T. SCHALLER: *Potash Minerals from the Texas-New Mexico Field.* Study of drill cores from 3 wells has identified the following potash minerals from this saline field: sylvite, polyhalite, carnallite, kainite, and langbeinite.

W. T. SCHALLER: *Base Exchange in Artificial Autunites.* Starting with artificially prepared autunite, definite crystalline compounds were made in which sodium, potassium, barium, manganese, or lead proxied for calcium. The soda, in artificial sodium autunite, was readily replaced by potassium, barium, and manganese.

O. F. POINDEXTER: *Constituents of Diamond-bearing Black Sands from Angola, Portugese West Africa.* (Paper presented by Frank R. Van Horn). The following minerals are present: diamond, corundum, tourmaline, staurolite, hornblende, zircon, rutile, garnet, cyanite, diallage, quartz, ilmenite, hematite and pyrite. Also possibly spinel, columbite, topaz, beryl, moonstone, opal, chalcedony. A black glassy mineral resembling in luster obsidian is also present. Hardness 6.5, sp. gr. 3.70. Biaxial, positive. $\beta = 1.75$, brownish, pleochroic. No analysis was made but believed to be a variety of augite.

C. S. ROSS: *Sedimentary Analcite in Arizona.* A fine grained sandstone-like material from western Arizona proved to be made up almost exclusively of small trapezohedrons, and the optical and chemical properties show the crystals to be analcite. The analcite forms beds in fine grained sediments of the playa type and are clearly part of a sedimentary series. It is evident, therefore, that analcite may be formed either by direct chemical precipitation or more probably by the reaction between concentrated alkaline solutions and colloidal clay material.

E. K. GEDNEY: *A New Method for the Determination of the Feldspars.* A short and accurate method for determining any feldspar is possible by comparing the spectrophotographs of unknown with those of known specimens. At the present stage of research this comparison also assures a quantitative analysis within one-half percent. of error, not only of the lime-soda content, but also of other alkalies, alkaline earths, and aluminum.

E. K. GEDNEY and C. W. BROWN: *Some New Occurrences of Rare Metal and other Minerals from the Cumberland Region of Rhode Island.* Over eighty distinct species with many varieties have been determined from this small but complex region. The area is marked by a widespread occurrence of rare metal minerals, such as eudialyte and titano-columbates of the rare earths, of a pronounced pneumatolytic and metasomatic origin.

W. A. TARR: *Doubly Terminated Quartz Crystals in Gypsum from Acme, New Mexico.* Splendidly developed doubly terminated crystals were found in a specimen of massive gypsum near Acme, New Mexico. The specimen was found on the outcrop of the gypsum but not in place. The quartz crystals range from a fraction of a millimeter up to an inch in length. All but the smallest are pink or red in color. The rhombohedral faces are well developed, but the prismatic faces are rough. The quartz crystals occur in a band two inches thick, having replaced the gypsum.

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At 12:40 P.M. the Society adjourned for lunch. At 2:10 P.M., President Rogers called the third session to order, and immediately proceeded with the final papers on the program.

J. W. GRUNER: *A Preliminary Report of the Crystal Structure of Analcite.* The Laue, powder and oscillation methods were used in investigation of the structure of analcite. In spite of the anomalies of the mineral which cast some doubt on its cubic character, it was impossible to find lower symmetry with the aid of X-rays. The lattice is cubic holohedral body-centered. The edge of the unit cube is 13.64 ± 0.05Å long. Each unit cube contains sixteen molecules $NaAlSi_2O_6 \cdot H_2O$. The space group is O_h^9(Oi-9, Wyckoff). Analcite dehydrated at 600° to 700° shows very little change in volume. The structure seems also to remain the same. Obviously the loss of the water has little influence on the arrangement of the atoms or ions in analcite.

F. R. VAN HORN: *Large Magnetite and Franklinite Crystals from Franklin Furnace, New Jersey.* In 1893 when visiting Franklin, a large crystal of magnetite was found which weighed 1205 grams. It is about 9 x 9 x 10 centimeters or $3\frac{1}{2}$ x $3\frac{1}{2}$ x 4 inches in size, and of rhombic dodecahedral habit with a small octahedron. The size is very unusual. In 1891 a large crystal of franklinite associated with zincite, tephroite and calcite was found which weighed 975 grams. The habit is octahedral with a small rhombic dodecahedron, the longest face of which is about 10 centimeters or 4 inches in length. A second specimen was found in 1893 consisting of a group of two crystals, the larger of which is about 8 centimeters or $3\frac{1}{2}$ inches long. Larger franklinite crystals have probably been found, but specimens of these dimensions are quite unusual.

E. S. LARSEN: *Mineralogical Data on the Humite Group.* The optical properties of the various members of the humite group studied by Brush and by Sjogren have been determined and give the following values for the members.

	α	β	γ	Ext.	2V	Disp.
Norbergite	1.568	1.572	1.588	0	med. large	$\rho > \nu$
Chondrodite	1.605	1.618	1.636	27°	large to over 90°	$\rho > \nu$
Humite	1.622	1.632	1.652	0	med. large	$\rho < \nu$
Clinohumite	1.623	1.636	1.651	7 to 15°	large	$\rho < \nu$
	1.652	1.663	1.681			

In general the chondrodites show little variation in the values of their indices of refraction but the Tilly Foster mineral has much higher indices ($\beta = 1.638$ to 1.655) with no chemical difference that would explain the high values.

For humite the Nordmarken mineral has $\beta = 1.643$, but this high value is probably due to the high iron content. ($FeO + Fe_2O_3 + MnO = 10.68$).

Clinohumite from Nordmark has $\beta = 1.663$ and high iron ($FeO + MnO = 15.44$), and the titano-hydroclinohumite from Italy has $\beta = 1.673$ with moderate iron ($FeO + Fe_2O_3 + MnO = 5.6$), low F (0.03), high TiO_2 (1.92), and high H_2O (3.16).

Norbergite has been found in abundance at Franklin Furnace and it is orthorhombic in symmetry, the crystals resembling those of humite.

CHARLES PALACHE and MARTIN A. PEACOCK: *Nature and Origin of the Amphibole-Asbestos of South Africa.* The study is based on a series of specimens of asbestos-bearing ironstones from Cape Province and the Transvaal, collected by the senior author on the Shaler Memorial Expedition to South Africa in 1922. Crocidolite and amosite occur in these rocks in persistent, interbedded, cross-fiber seams. On the basis of optical and chemical study of favorable material the data of these minerals have been revised and extended. In the genetic discussion the following have been treated: the origin of the iron stones; the sources of the constituents of the asbestos seams; the conditions which promoted the formation of asbestos; and the special conditions which determined cross-fiber structure. Seven new analyses are contributed.

CHARLES PALACHE: *Mineralogical Notes on Franklin Furnace.* Notes compiled with the assistance of Messrs. L. H. Bauer, H. Berman and L. W. Lewis on the occurrence, composition, crystallography, and chemical properties of the following minerals: azurite, cahnite, clinozoisite, gageite, glaucochroite, hetaerolite, hodgkinsonite, quartz, smithsonite, sussexite, tephroite, tetrahedrite, and willemite.

LYMAN W. LEWIS: *The Paragenesis of the Granite Pegmatite of Fitchburg, Massachusetts.* (Read in abstract.) In the Fitchburg quarries persistent pegmatite dikes from an inch to over a foot in width have been injected along a conjugate system of fractures. The walls are clean cut in the field with a border of microcline on both contacts and a center filling of quartz against the crystal boundaries of the feldspar. The pegmatites consist essentially of microcline and quartz with subordinate black tourmaline, beryl, garnet and allanite. Evidence is presented to support the thesis that all the minerals in the pegmatite crystallized in the same late magmatic phase, and that reaction and replacement of early minerals is unimportant in the formation of these pegmatites.

LYMAN W. LEWIS: *The Calculation of the Interfacial Angles from Coordinate Elements in the Hexagonal System.* (Read in abstract.) Presentation of a method of expressing the relations between interfacial angles and polar elements with corresponding position angles in the hexagonal system, together with necessary formulas and examples.

L. H. BAUER and HARRY BERMAN: *Friedelite, Schallerite, and Related Minerals.* A reexamination of the friedelite-schallerite group and some intermediate members, of which there are new analyses available. Also an attempt to classify some related minerals as being members of a more extensive series to which friedelite, schallerite, pyrosmalite, and possibly dixenite, hematolite and the new Franklin mineral mcgovernite belong. The discussion is chiefly optical and chemical.

E. P. HENDERSON: *Uvarovite from California.* The analysis of this chromium garnet was made to confirm the variety uvarovite. Hasty search through the literature, shows few analyses with high chromium percentages; and in many cases the iron, aluminum and chromium were not separated. This garnet has sufficient chromium to confirm the existence of uvarovite as a variety.

E. P. HENDERSON: *Correlation of chemical composition and the optical properties of Triplite.* Triplite is a mineral whose chemical composition varies greatly. Some contain only small percentages of FeO (as low as 1.68%), others as high as 41.42% FeO. The optical values change as the percentage of FeO increases. It seems advisable to limit the name triplite to the manganese fluor-phosphate and give the name zwieselite to the iron fluor-phosphate. The name zwieselite is now in the literature as the iron rich variety of triplite. The calcium and magnesium present in the analysis can be accounted for by isomorphism, a mixture of the spodrosite and wagnerite molecules, respectively.

JOSEPH L. GILLSON: *Stages in the Contact Metamorphism in the Pend Oreille District of Northern Idaho.* The Pend Oreille district lies around the southern arm of Lake Pend Oreille, in northern Idaho. There, quartzites and argillites belonging to the Belt series of Algonkian age, and a Cambrian quartzite, shale and limestone have been intruded by Mesozoic granodiorites. The resulting metamorphism was intense and widespread. The exomorphism proceeded in three overlapping stages, as follows: 1. A recrystallization of the limestone to marble, and the quartzites and agillites to adinoles; a process caused by a general distillation of hot juvenile waters, carrying soda, during the intrusion of the magma. 2. A formation by metasomatism in the marbles and adinoles of a considerable variety of high-temperature silicates. These minerals formed after the intrusive rock was solid at the margin, but still very hot. 3. A replacement of these earlier minerals by muscovite, sericite, chlorite, magnetite, and pyrrhotite, and, in exceptional cases, by zeolites and carbonates. Only the third stage is represented in the endomorphism. Muscovite, sericite, chlorite, magnetite, and locally molybdenite and other sulphides and calcite formed in a progesssive sequence in the solid granodiorite by solutions which seem to have ascended along the margins of the intrusive.

VICTOR GOLDSCHMIDT and S. G. GORDON: *Crystallographic Tables for the Determination of Minerals.* (Read in abstract). Tables have been prepared of 1025 species, and 193 important varieties and doubtful species. Of this number crystallographic data are available for 759 minerals, and these have been so arranged as to be convenient for the determination of a species by goniometric measurement.

S. G. GORDON: *The Convenience of a Rotating Table in the Use of the Two-circle Goniometer.* (Read in abstract). By mounting the Goldschmidt Two-circle goniometer on a rotating table, the apparatus can be turned to bring the vertical circle and horizontal circle successively in a position for comfortable reading of angles.

ALFRED C. HAWKINS: *Casts and Pseudomorphs of the Soluble Minerals in the Triassic Shales of Central New Jersey.* (Read in abstract). Cavities of glauberite in individual crystals and groups occur at Blackwells Mills, New Jersey, filled with calcite, which forms a pseudomorphous replacement. (In red shale). Similar glauberite cavities found at New Brunswick, New Jersey, contain small barite crystals

in addition to the calcite. Hopper-shaped cavities which were originally occupied by halite crystals occur near New Brunswick, New Jersey, in red shales. This is the first time that such halite cavities have been reported in the Triassic at any point south of New England.

M. N. SHORT: *Microchemical Determination of the Ore Minerals.* The identification of ore minerals in polished sections up to the present has been based on their appearance and upon certain etching effects brought about by a set of standard chemical reagents. The result of ten or more years' experience in applying these tests indicates that they are not entirely to be relied upon without confirmation by other methods. It is believed that qualitative microchemical tests for the elements in the minerals are the most reliable means of identification. This paper outlines the methods of applying such tests.

L. S. BROWN: (Introduced by J. T. Lonsdale). *Occurrence of Rutile, Ilmenite and Leucoxene in Mid-Continental Sediments.* Making some rather extensive investigations of so-called "heavy mineral" residues of Mid-Continent sediments (Permian red sandstones) it was found that approximately 70% of such residues from a bromoform separation consisted of leucoxene, ilmenite and rutile, the former predominating. Some of the characters observed include characteristic rutile and ilmenite structures and their survival in the leucoxene. Also alteration of rutile to leucoxene is demonstrated and attempts made to determine whether such alteration occurred prior or subsequent to disintegration of parent rock. A possible and probable explanation of the "pitting" of sedimentary leucoxene as described by Milner is discussed.

STEPHEN RICHARZ: *Stilbite from the Keweenawan Lavas of Northern Wisconsin.* Several hundred yards above the Copper Falls near Mellen in Northern Wisconsin, well developed stilbite crystals were found in a vein in the Keweenawan basic lavas, associated with calcite and quartz. It seems to be the mineral which was regarded by former geologists as laumontite. The refractive indices are considerably less than those of laumontite and even less than those observed heretofore for stilbite. The highest index is close to 1.490, compared with 1.500 in other occurrences of this zeolite. The axial angle is appreciably larger than in stilbite of most authors. Heating changes the optical orientation of the mineral.

LEWIS C. RAMSDELL: *The Crystal Structure of Cuprous Sulfide.* X-ray diffraction patterns of a cubic type can be secured by heating Cu_2S above its inversion point (91°C.) or at ordinary temperatures from Cu_2S which contains more than 8% excess S in solid solution. The excess S prevents the inversion to the low temperature form. The somewhat meager X-ray data are in excellent agreement with the CaF_2 type of structure.

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The last paper was finished at 4:45 P.M., after which it was moved that the thanks of the Society be extended to the local committee, and to the authorities of Case School of Applied Science and Western Reserve University for their kindness and hospitality. This was seconded and unanimously adopted; after which the Society adjourned. At this meeting three memorial biographies and thirty-four scientific papers were presented. This was the longest program ever given before the Society. Seventy-seven fellows, members and guests attended the meeting which was the largest in the history of the Society.

The following registered at the meeting: E. O. Adams, W. M. Agar, V. T. Allen, H. L. Alling, H. M. Bannerman, Miss Florence Bascom, A. M. Bateman, L. S. Brown, J. D. Burfoot, Jr., Lazard Cahn, Miss Ferga Carmichael, R. J. Colony, C. W. Cook, A. R. Crook, E. E. Fairbanks, C. R. Fettke, D. J. Fisher, W. F. Foshag, A. S. Furcron, E. K. Gedney, V. A. Gianella, Russell Gibson, J. E. Gill, J. L. Gillson, James Gilluly, W. A. P. Graham, J. R. Gruner, E. P. Henderson, D. F. Hewett, T. M. Hills, A. P. Honess, W. F. Hunt, P. F. Kerr, D. E. Kerr-Lawson, E. H. Kraus, K. K. Landes, A. C. Lane, E. S. Larsen, J. V. Lewis, J. T. Lonsdale, T. S. Lovering, E. B. Mathews, W. J. McCaughey, B. L. Miller, C. E. Miller, W. J. Miller, E. S. Moore, Charles Palache, W. J. Paquette, A. L. Parsons, A. B. Peck, A. H. Phillips, L. S. Ramsdell, C. H. Richardson, Stephen Richarz, H. Ries, A. F. Rogers, C. S. Ross, Edward Sampson, J. F. Schairer, W. T. Schaller, M. W. Senstius, M. N. Short, C. B. Slawson, R. E. Sommers, M. H. Stow, W. A. Tarr, Ellis Thomson, D. W. Trainer, Jr., James Trythall, F. R. Van Horn, A. J. Walcott, T. L. Walker, Paul Weaver, L. G. Westgate, A. N. Winchell, and A. O. Woodford.

LIST OF FORMER OFFICERS AND MEETINGS, WITH DATES

By recommendation of the Council, a complete list of past officers is printed in the proceedings of the annual meeting of the Society.

PRESIDENTS

1920	Edward H. Kraus
1921	Charles Palache
1922	Thomas L. Walker
1923	Edgar T. Wherry
1924	Henry S. Washington
1925	Arthur S. Eakle
1926	Waldemar T. Schaller
1927	Austin F. Rogers

VICE-PRESIDENTS.

1920	Thomas L. Walker
1921	Waldemar T. Schaller
1922	Frederick A. Canfield
1923	George F. Kunz
1924	Washington A. Roebling
1925	Herbert P. Whitlock
1926	George Vaux, Jr.
1927	George L. English

SECRETARIES.

1920–1922	Herbert P. Whitlock
1923	Frank R. Van Horn

TREASURERS.

1920–1923	Albert B. Peck
1924	Alexander H. Phillips

EDITORS

1920–1921	Edgar T. Wherry
1922	Walter F. Hunt.

COUNCILLORS

1920 Arthur S. Eakle, Frank R. Van Horn, Fred E. Wright, Alexander H. Phillips.
1921 Frank R. Van Horn, Fred E. Wright, Alexander H. Philips, Austin F. Rogers.
1922 Fred E. Wright, Alexander H. Phillips, Austin F. Rogers, Thomas L. Watson.
1923 Alexander H. Philips, Austin F. Rogers, Thomas L. Watson, Esper S. Larsen.
1924 Austin F. Rogers, Thomas L. Watson, Esper S. Larsen, Arthur L. Parsons.
1925 Thomas L. Watson, Esper S. Larsen, Arthur L. Parsons, William F. Foshag.
1926 Esper S. Larsen, Arthur L. Parsons, William F. Foshag, William A. Tarr.
1927 Arthur L. Parsons, William F. Foshag, William A. Tarr, Alexander N. Winchell.

ANNUAL MEETING PLACES

1920 Chicago, Illinois
1921 Amherst, Massachusetts
1922 Ann Arbor, Michigan
1923 Washington, D.C.
1924 Ithaca, New York
1925 New Haven, Connecticut
1926 Madison, Wisconsin
1927 Cleveland, Ohio

NOTES AND NEWS

THE CONVENIENCE OF A ROTATING TABLE IN THE USE OF A TWO-CIRCLE GONIOMETER

SAMUEL G. GORDON, *Academy of Natural Sciences of Philadelphia.*

With the development of the two-circle goniometer by Goldschmidt, mineralogists were given an instrument which obviated the necessity of constantly resetting a crystal. The position of the vertical circle, however, is such as to cause considerable inconvenience in reading. It is necessary to get up and walk to the side of the instrument in order to read the vernier.

The writer is aware of two attempts to overcome this handicap, on one instrument the circle was graduated on the edge; on another, a device for reflecting the vernier, by a system of mirrors, into the same telescope used for reading the horizontal circle, was employed.

The writer has found that a rotating table, of the type that microscopists used for shifting a microscope from one person to another, was most convenient, (Fig. 1).

FIG. 1. Goniometer mounted on rotating table.

This table is 30 inches in diameter, and 29 inches high, and carries the entire instrument and lamp. The axle is 1.5 inches in diameter and 3.5 inches long, and is rigidly