PROCEEDINGS OF THE NINTH ANNUAL MEETING OF THE MINERALOGICAL SOCIETY OF AMERICA AT NEW YORK CITY

FRANK R. VAN HORN, *Secretary.*

The Mineralogical Society of America held its ninth annual meeting on December 27, 28, and 29, 1928, in conjunction with the Geological Society of America and the American Association for the Advancement of Science, at New York City, as guests of the American Museum of Natural History and Columbia University. On Thursday December 27, at 2:00 P.M., President E. S. Larsen called the regular annual meeting to order in the New York Academy Room of the American Museum of Natural History. 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 had been printed on pages 105–117 of Volume 13 (Number 3) of THE AMERICAN MINERALOGIST.

ELECTION OF OFFICERS AND FELLOWS FOR 1929

The Secretary announced that 152 ballots had been cast unanimously for the officers as nominated by the Council. For fellows there was a unanimous vote of 69 ballots in the affirmative. All officers and fellows were declared elected.

The officers elected for 1929 are the following:

President: Arthur L. Parsons, Toronto University, Toronto, Canada.

Vice-President: Edward Wigglesworth, Boston Society of Natural History, Boston, Massachusetts.

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, 1929–1932: Clarence S. Ross, United States Geological Survey, Washington, D. C.

The fellows elected follow:

Martin J. Buerger, Massachusetts Institute of Technology, Cambridge, Massachusetts.

John W. Gruner, University of Minnesota, Minneapolis, Minnesota.

Walter H. Newhouse, Massachusetts Institute of Technology, Cambridge, Massachusetts.

The Secretary also announced that the Council by virtue of authority given it by the Constitution had elected the following Honorary Life Fellows:

Professor Friedrich J. Becke, University of Vienna, Austria.

Professor Reinhard Brauns, University of Bonn, Germany.

Professor Waldemar C. Brögger, University of Oslo, Norway.

Professor Friedrich Rinne, University of Leipzig, Germany.

REPORT OF THE SECRETARY FOR 1928

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 235 members in good standing. Three fellows and 31 members have been dropped from the

mailing list for non-payment of dues, so that there is a loss of 3 fellows and a gain of 17 members for the year. No deaths have been reported during the year. In addition to the 340 fellows and members, there are 185 subscribers, a gain of 22 for the year. A total of 525 paid copies of the Journal are mailed monthly, an increase of 46 over last year. Actually, during the past year, 3 fellows, 50 members, and 22 subscribers or a total of 75 were added, and the net gain of 46 is larger than last year.

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

REPORT OF THE TREASURER FOR 1928

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 A. C. Hawkins, Harry Berman and R. B. Gage, and later reported to the Secretary that they found the books of the Treasurer correct. The Treasurer's report follows:

To the Council of the Mineralogical Society of America: Your treasurer herewith submits his annual report for the year ending November 30, 1928:

RECEIPTS

Cash on hand December 1, 1927	$3,210.61	
Dues and subscriptions	1,535.27	
Advertisements	232.15	
Sale of back numbers	984.28	
Interest on Endowment and bank deposits	2,441.54	
Miscellaneous	37.58	
		$8,441.43

DISBURSEMENTS

Printing and distribution of the Journal	$3,091.39	
To the Editor, Secretary and Treasurer	700.00	
Printing of separates	110.55	
Stationery and postage	39.90	
Miscellaneous	52.25	
2 $1000 Bonds, Trenton Mortgage & Title Guarantee Co. ($5\frac{1}{2}$%, due 1937)	2,022.92	
	$6,017.01	
BALANCE in Princeton Bank & Trust Co., Nov. 30, 1928	2,424.42	$8,441.43

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 $4\frac{1}{4}$%	400.00	
3 $100 bonds of the Great Northern R.R. $5\frac{1}{2}$ Gold	300.00	
2 $1000 bonds, Trenton Mortgage & Title Guarantee Co., $5\frac{1}{2}$%, due 1937	2,000.00	
	$47,700.00	

Respectfully submitted,
ALEXANDER H. PHILLIPS, *Treasurer.*

REPORT OF THE EDITOR FOR 1928

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: A critical survey of the status of the Journal for the year that is now drawing to a close reveals both pleasant and unpleasant features. In a number of respects 1928 has been the most satisfactory year in the history of the Society. It is gratifying to report that the steady growth, in recent years, in the size of the *Mineralogist* has culminated in the establishment of a new record of 600 pages for the current volume. This is equivalent to an average of 50 pages for each of the 12 numbers. This figure represents an increase of 150 pages over the previous high mark of a year ago.

There are two factors that, no doubt, have contributed to the attainment of this new goal. One large special issue of 170 pages, containing 14 articles, has of course greatly assisted in producing this high total. The unsolicited laudatory letters received, from home and abroad, upon the appearance of each special number clearly indicates that this policy should be continued and encouraged. It is hoped that the publication of at least one special issue each year might become a regular feature of the Journal, but thus far only two institutions have availed themselves of the opportunity to take over an entire number.

It is also believed that the change in policy whereby contributors are granted 50 reprints has had the effect of attracting a number of articles that otherwise might have been sent elsewhere. This policy which became effective with the March issue has proved so satisfactory to our contributors that it is safe to say that it will become a fixed policy for the future. This innovation has not been a heavy burden financially as the extra cost to the Society for these reprints for the nine months period has averaged about $20 per issue.

Incidentally it may be stated that the reprint business is a sensitive subject with all publishers. The volume of such business after all is small and unprofitable, but they regard this phase of their work as a necessary evil and attempt to establish rates based on actual cost. After a lengthy correspondence an agreement has been reached with our publishers (but not without a struggle) whereby the rates now in force will continue for another year.

Two years ago the Council authorized an expenditure of $850 to republish the first five volumes of the Journal. It seemed at that time that the demand for these early numbers, and for subsequent issues which the early volumes would make available, justified the venture. The sale of back numbers within the last two years has demonstrated the wisdom of this undertaking. Professor Phillips's report a year ago indicated a sale of $500 and this year that amount has been doubled. In less than two years the total cost of reprinting has been met while more than half of the supply of these volumes are still on hand for future calls.

While this brief review covers some of the more encouraging aspects there are also a number of features of a less pleasant nature that should be mentioned in an honest appraisal of the year's work. The dues and subscriptions received during 1928 show a decrease over the same period a year ago. A slight increase in revenue

from this source, rather than a decrease, might very reasonably be considered a normal expectancy. Surely the interest in mineralogy is not on the decline and the price of the Journal could hardly be considered excessive as it is being sent to the members at less than actual cost.

The summer and fall issues are still a matter of grave concern to the Editor. In the past publication during the summer has only been made possible by drawing upon manuscripts received in the spring and purposely held back to tide over this lean period. But this procedure has the objectionable feature of causing undue delay and most authors are quite insistent (and rightly so) upon prompt appearance. To conform to their wishes in all instances would, however, result in the suspension of the Journal during several months of each year. Perhaps that will be the ultimate solution but I am still hopeful that when the seriousness of the situation is fully realized sufficient material will become available to insure twelve issues without holding back certain articles six months as was the case this year.

In attempting an analysis of the Journal we find that 42 individuals have contributed one or more of the 57 leading articles that have appeared in the current volume. These articles represented contributions from 26 different Universities and research Bureaus. It is gratifying to note that nine manuscripts were received from outside of the States, one each from Peru, Germany and Australia, and six from Canada.

Of the 57 leading articles, 6 recorded for the first time descriptions of new mineral species; 7 described famous mineral localities; 23 called attention to new data on established species and 21 consisted of addresses, memorials and articles of a miscellaneous character.

The series of mineral locality articles, which was started several years ago, should appeal especially to our friends the collectors and will be continued from time to time as suitable material becomes available. I am sure all of you will be delighted to know that the January issue will include a paper by Professor Palache on a *Paragenetic classification of the minerals of Franklin, New Jersey*, while in the February number the same author will compare the ore deposits of Långban, Sweden, with those of Franklin.

The 57 leading articles of the present year occupied 526 pages or 88.7% of the total space, while 15 book reviews, 24 reports of proceedings of societies, 48 abstracted accounts of new mineral names and 43 other items of general interest, including short articles and brief discussions, filled the remaining 67 pages or 11.3% of the space of the Journal.

In conclusion may I leave with you these two suggestions and ask your assistance in seeing them realized; first, the desirability of substantially increasing from year to year the membership of the Society in order that the interest in the subject of mineralogy might be adequately maintained; and second, the need of more material for the Journal if the growth enjoyed in the past is to be continued.

The concluding table of contents summarizes the distribution of subject matter in volume 13.

DISTRIBUTION OF SUBJECT MATTER IN VOLUME 13

Subjects		*Articles*	*Pages*	*Per Cent of total*
Original articles				
New mineral species	6			
Mineral locality articles	7			
New data on established species	23			
Memorials, addresses, etc.	21			
	—	57	526½	88.7
Proceedings of societies		24	27	
Notes and news		43	15½	11.3
Book reviews		15	9½	
Abstracted accounts of new mineral names		48	14½	
Total of text		187	593	100.0
Illustrations		179		
Covers, advertisements, index			94	
Total			687	

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

REPORT OF THE COMMITTEE ON NOMENCLATURE AND CLASSIFICATION OF MINERALS

Dr. H. S. Washington, Chairman, reported that the members of the committee residing in Washington had had one meeting, and asked that the committee be discharged. A motion to this effect was carried. Dr. W. T. Schaller then moved that the President appoint a special committee of three, of whom not more than one has served on the Committee on Nomenclature, to reread all of the reports of that committee and abstract therefrom the most pertinent and important suggestions and submit them, in condensed form, at the next meeting, with a request that such a condensed report be printed in *The American Mineralogist.* This motion was seconded and after some discussion was carried. The President appointed W. T. Schaller, C. S. Ross, and E. T. Wherry.

REPORT OF THE COMMITTEE ON PRESERVATION OF TYPE MINERALOGICAL MATERIAL

Dr. W. T. Schaller read the second and final report signed by all the members of the committee and asked that the committee be discharged. A motion to this effect was carried. The report of the committee follows:

SECOND REPORT OF COMMITTEE ON PRESERVATION OF TYPE MINERALOGICAL MATERIAL

The Committee on Preservation of Type Mineralogical Material has been considering the possibility of devising a scheme for the permanent preservation of all type mineralogical material, especially new species, so that it may be pre-

served for future comparison and reference. It has not been possible to select a single institution for such a repository as many institutions consider the original material described by their members as part of their most highly prized possessions,—and rightly so. Other institutions, however, may feel that a designated repository may be better suited for the permanent preservation of type material than their own and may be willing to send it, or part of it, to a duly designated place, for permanent preservation.

It is not practical to designate, officially, one or two repositories for such type material, but the Committee recommends that all members residing in the United States be strongly urged, whenever such a course is feasible, to deposit their type material (holotype) or part of the type collection (paratype) in the U. S. National Museum at Washington, and that those members residing in Canada select one or more places in Canada where such type material can be preserved.

The Committee also recommends that all authors of mineralogical papers, and especially those describing new minerals or giving new facts, be urged to state in their paper the disposition of the type material. If entirely consumed (as it never should be), or if any of the material be sent to any repository, a statement to that effect should be given.

W. T. SCHALLER, *Chairman*
A. N. WINCHELL
A. L. PARSONS
H. P. WHITLOCK
W. F. FOSHAG

REPORT OF REPRESENTATIVE ON THE NATIONAL RESEARCH COUNCIL

The representative of the Society, Dr. W. T. Schaller, gave a summary of the work attempted by the National Research Council and some of its committees during the past year.

NEW BUSINESS

Dr. T. L. Walker mentioned the possibility of a mineralogical section at the International Geological Congress to be held July 29, 1929 at Pretoria, South Africa, but stated that he had heard nothing definite about such a section.

PRESENTATION OF PAPERS

At 2:45 P.M., there being no further business, the Society proceeded to the reading of scientific papers. The papers presented with short abstracts follow:

ARTHUR L. PARSONS: *The Determination of the Crystallographic Constants in Crystals of the Triclinic System.* The linear and polar constants are calculated directly and independently from two-circle measurements with the exception of γ which is determined from the five known angles. Average values are obtained for α, β, γ, c/a, c/b, p_0^1, q_0^1, ϕ_0 and ρ_0. The assigning of Weiss and Miller symbols is shown graphically.

W. T. SCHALLER: *Crystallography of the Quartz Pseudomorphs from Paterson, New Jersey.* Angular measurements of the faces of the quartz pseudomorphs from Paterson show identity with the angles of glauberite.

H. P. WHITLOCK: *Some Devices and Models for the Demonstration of Symmetry.* These devises and models are of several types. (1) There is a series of stereograms, that, beginning with close piled particles, show in three dimensional graphs the symmetry of several atomic group types. (2) There is a series of symmetry-targets which rotate designs drawn in flat symmetry, and also three dimensional portions of crystal models. (3) There is an adaptation of kindergarten blocks to the building of symmetrical designs in two-dimensional patterns.

A. F. ROGERS: *A Study of the Crystal Systems.* Crystal systems are not fundamental in the sense that crystal classes are; they are, however, useful and convenient. Contrary to general opinion, crystal systems are not based primarily upon the kinds of axes of reference used but upon the properties that certain classes have in common.

Since systems are not fundamental, all ideas and terms involving holohedrism and merohedrism should be discarded.

Six systems are used instead of seven; the hexagonal system is divided into two sub-systems, the rhombohedral sub-system with five classes and the hexagonal sub-system with seven classes.

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At 3:55 P.M., the Society adjourned to the Duplex Assembly Room of the Museum to attend a joint session with the Geological Society of America at 4 P.M. before which the presidential address of Professor Esper S. Larsen on *"The Temperatures of Magmas"* was given. This paper is published in full in this number. Following this address with E. S. Larsen presiding, papers of the Geological Society of a mineralogical and petrographical nature were presented. The joint session adjourned at 6 P.M.

On Friday, December 28, at 9:12 A.M., President Larsen called the second session of the Society to order in the New York Academy Room of the Museum, and the reading of papers proceeded according to program.

A. F. ROGERS: *Polysynthetic Twinning in Dolomite.* The most common type of twinning in dolomite is polysynthetic with $(02\bar{2}1)$ as twinning plane. The twinning lamellae appear as "striations" parallel to the short, long, or both diagonals of the rhombs of the cleavage surfaces. Especially good examples are found at Tilly Foster, New York, Providence, R. I., and Charlemont, Mass. The Tilly Foster dolomite shows parting parallel to $(02\bar{2}1)$, which is due to twinning.

Polysynthetic twinning with $(02\bar{2}1)$ as twinning plane is very common in the dolomite of metamorphic rocks and affords a convenient method of distinguishing dolomite from calcite.

E. POSNJAK AND G. TUNELL: *The Optical and Geometrical Properties of the Basic and Normal Cupric Sulfates and Cupric Oxide, Tenorite.* Data for the indices of refraction, pleochroism, optical orientation, geometrical crystallographic elements and the x-ray diffraction patterns of the basic and normal cupric sulfates and cupric oxide were obtained as part of an investigation of the system, CuO–SO_3–H_2O. Definite compounds in separate single crystals were synthesized, several of which are well known to mineralogists. Solid solution which had been reported was proved not to occur.

LEWIS S. RAMSDELL: *An X-ray Study of the Domeykite Group.* A correlation of the members of the domeykite group with the Cu—As constitution diagram. This paper will be printed in an early issue of this Journal.

JOHN W. GRUNER: *On the Structure of Boracite.* Large dodecahedra of boracite each consisting of twelve orthorhombic sectors were cut into sections for oscillation spectrograms in the seven major crystallographic directions. The unit cell of boracite is base centered orthorhombic, and contains eight molecules of $Mg_6Cl_2B_{14}O_{26}$. Its dimensions are $a_0=b_0=16.97$ A°. $c_0=12.00$ A°. The space group is probably C^{11}_{2v}, though C^{12}_{2v} could not be eliminated as a possibility.

ERNEST E. FAIRBANKS: *Photo-luminescence of Minerals.* The fluorescence of minerals obtained by excitation with ultra-violet light from which practically all visible light has been filtered out, is a fascinating study. Fluorescence has been found useful to the mineralogist in a number of ways. A brief review of some of these applications is given including the identification of gems and minerals, and the detection of minute quantities of certain activating materials. The transmission of filters and of the quartz mercury lamp is described.

A. F. ROGERS: *Mineral Determination in Crushed Fragments with the Polarizing Microscope.* The value of the polarizing or petrographic microscope in determining minerals by means of crushed fragments is emphasized. It has been found that on account of cleavage and structure the shape of crushed fragments is highly characteristic of many minerals.

A convenient method of arranging and using index liquids in dichotomous order is described.

C. E. MILLER: *The Interfacial Tension of Crystal Faces.* A study of the interfacial tension of crystal faces, and its effect upon liquids of known surface tension. Preliminary results, purely qualitative, showing that real differences in the interfacial tension for various minerals and crystal forms do exist, were obtained by Quincke's "flat liquid drop" method, the relative amount of "wetting" being noted. Quantitative values seem to be impossible on account of the many disturbing factors that tend to influence the results and for which compensation must be made; room vibrations, temperature changes, crystal face variations, and possible chemical affinity of the minerals for the liquids used. The following minerals have been studied: celestite, barite, pyrite, sulphur, spinel, franklinite, fluorite, calcite, stibnite, gypsum, quartz, tourmaline, and the micas.

W. T. SCHALLER: *Ending of Chemical Adjectives in Isomorphous Minerals.* Isomorphous replacement of an element by a minor and variable other element should be designated by a chemical adjective which should have a uniform ending. Several such endings are considered, objections noted, and suggestions made for a uniform procedure.

W. T. SCHALLER: *The Ludwigite Group.* The end members of the ludwigite series are: ludwigite 4 MgO. B_2O_3. Fe_2O_3, and vonsenite 4 FeO. B_2O_3. Fe_2O_3. Both are orthorhombic with similar angles. The two end members are isomorphous. The names ferroludwigite and magnesioludwigite are to be discarded.

L. H. BAUER AND HARRY BERMAN: *On a New Basic Sulphate and Two Borates of Magnesium from Sterling Hill and Franklin, New Jersey.* A basic sulphate from Sterling Hill is associated chiefly with pyrochroite, calcite and with a new borate. It occurs in two varieties differing slightly in the amount of the bases present and in the formulae assigned: Mooreite $7R(OH)_2.RSO_4.4H_2O$; δ–Mooreite $6R(OH)_2.RSO_4.4H_2O$, where R = Mg, Zn, Mn.

Both are monoclinic and in tabular crystals. The name mooreite is proposed for this mineral in honor of Gideon E. Moore, an early investigator of Franklin minerals.

The borate associated with mooreite, and another borate from Franklin, associated with zincite and smithsonite, are probably new species closely related to fluoborite.

L. H. BAUER AND HARRY BERMAN: *A New Basic Carbonate of Managanese and Zinc from Franklin, New Jersey.* In a single specimen from Franklin, N. J., bluish white needles of the new mineral are associated with sussexite, pyrochroite and calcite. These needles are monoclinic and have the following composition: $2RCO_3.5R(OH)_2$, where R is chiefly manganese and zinc.

The name loseyite is proposed for this mineral in honor of S. R. Losey, a former resident of Franklin, active in the preservation of the local minerals.

W. F. FOSHAG: *Carminite from Mexico and Colorado.* Carminite, a very rare arsenate of lead and iron, was first described as occurring sparingly in the Luise limonite mine at Horhausen, Germany. Later small amounts have been found at Cornwall. More recently this mineral has also been found at the Ojuela Mine, Mapimi, Durango, Mexico, and in Colorado. Its chemical composition is shown to be $PbO.Fe_2O_3.As_2O_5.H_2O$. The crystallization orthorhombic.

A. F. ROGERS: *Periclase from Crestmore, near Riverside, California.* To the list of about 70 minerals found in the contact-metamorphic zone, berween granodiorite and limestone at Crestmore, California, another must be added, namely periclase or isometric magnesium oxide. The periclase occurs as cores within some of the brucite of the calcite-brucite rock or predazzite. The brucite has been formed by the hydration of the periclase probably by hydrothermal alteration. The associated minerals are chondrodite and spinel.

This is the second occurrence of periclase in the United States and there are at least three other occurrences of predazzite.

M. N. SHORT AND E. V. SHANNON: *Violarite, a Rare Nickel Mineral.* The formula for violarite has been determined to be $(Ni, Fe)_3S_4$ on carefully selected material from Sudbury, Ontario, and from the Friday mine, San Diego County, California. Violarite is similar in composition and physical properties to linnaeite, Co_3S_4.

C. B. SLAWSON: *Quantitative Optical Determination of Potassium and Sodium Chlorides.* When potassium and sodium chlorides are fused together mixed crystals with the composition xKCl.yNaCl are formed. These mixed crystals may be identified by the determination of the index of refraction and the relative percentages of potassium and sodium may be estimated to within 2%. The mixed crystals are not stable at ordinary temperatures.

E. S. LARSEN AND W. T. SCHALLER: *Serendibite from Warren County, New York.* This second locality of serendibite is along the contact of Grenville limestone and granite gneiss. Associated minerals are typical contact-metamorphic ones:—phlogopite, diopside, tremolite, spinel, etc. An unknown silica-free mineral with optical constants like diopside is present. The serendibite is granular massive without crystal faces. Optically +, 2V near 90°, $\alpha=1.701$, $\beta=1.704$, $\gamma=1.706$. Prominent polysynthetic twinning.

Chemical analysis yields formula: $4SiO_2.3Al_2O_3.2CaO.4MgO.B_2O_3$.

A. R. CROOK: *An Illinois Record Copper Erratic.* In various places in Illinois, chiefly in association with Illinoian and Wisconsin drift, numerous pieces of drift copper have been found.

A table is given showing weight, dimensions, name of finder, locality where discovered and where preserved, of all specimens known to the writer to have been found in drift in Illinois.

They range in weight from a fraction of an ounce to 1606 pounds. As far as known, the latter is the largest ever found in Illinois. It is an irregular oblong mass, 51 in. long, 34.5 in. high and 6 in. thick. There are a few projections remaining after its 500 mile trip from the Lake Superior region. It was discovered by a young farmer on his farm eight miles southwest of Canton. On the flat sides glacial striae are much in evidence and in the hollows are dendritic and aborescent patches. Calcite crystals appear in places but no silver is discernable. It is now in the State Museum.

LEVI S. BROWN (Introduced by Frank R. Van Horn): *Notes on the Appearance of Tourmaline in Sediments.* Correlation in Mid-Continent sediments, Permian and Pennsylvanian, is largely on the basis of petrography alone. Tourmaline is always present, but in exceptionally varied appearance. Hence, in routine examination prompt identification is sometimes difficult. Some of the characters of the tourmaline, as here exhibited, are described in some detail, in this paper.

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The last paper was finished at 1 P. M., after which it was moved that the thanks of the Society be extended to the local committee, and to the authorities of the American Museum of Natural History and Columbia University for their kindness and hospitality. This was seconded and unanimously adopted after which the Society adjourned to meet at 2 P. M. in joint session with the Society of Economic Geologists.

The joint session with the Society of Economic Geologists was called to order at 2:15 P. M. by President Larsen. Later in the afternoon, President W. H. Emmons of the Economic Geologists was in the chair. Short abstracts of papers presented by members of the Mineralogical Society follow:

SAMUEL G. GORDON: *The Passing of the French Creek Mines.* After years of idleness the French Creek Mines were reopened in 1915. On October 13, 1928, the mine was abandoned as exhausted. In that period 850,000 tons of iron ore was mined. The mine was noted as a local source of fine specimens of pyrite, chalcopyrite, magnetite, apophyllite, calcite, and many other minerals.

SAMUEL G. GORDON: *Remarks on Llallagua Phosphates.* Apatite and wavellite are very abundant minerals in the Llallagua tin mines. Vivianite is not uncommon.

Vauxite, paravauxite, and metavauxite have frequently been found. Monazite and xenotine have recently been identified as occurring rarely. A new analysis shows the composition of wavellite to be $2Al_2O_3.2P_2O_5.2Al(OH,F)_3.10H_2O$. A variety of allophane containing 7.97% P_2O_5 is called phosphate allophane.

GEORGE L. ENGLISH: *Diamonds and Diamond Mines in South Africa.*

(a) The Diamond:
Its Form and Physical Properties.
Its Genesis.
(b) Occurrences of Diamonds in South Africa.
New Discoveries.
(c) From the dark mine to the glittering ball room.

CHARLES PALACHE: *Paragenetic Classification of the Minerals of Franklin, New Jersey.* A list is given of 137 species of minerals which are found in the region near Franklin, N. J. It is shown that these may be classified genetically into five groups of varying importance. Of the whole number of species, 111 are found in the zinc ore-bodies and 98 in these only; 13 are found in granite pegmatites; 18 in iron ores of pegmatic origin; 26 in the Pre-Cambrian limestone and 5 in the Paleozoic limestone. These five paragenetic groups are described, those of less importance first and then the main group of the zinc-ore minerals. A paragenetic table for this group shows four main subdivisions viz:—(1) Primary Ores: (2) Pegmatite Contact Minerals, (a) Skarns and recrystallization Products; (b)Pneumatolytic Products: (3) Hydrothermal Vein Minerals: (4) Surface Oxidation Products.

Each of these groups is described with examples of characteristic mineral associations.

The origin of the zinc ores is discussed.

CHARLES PALACHE: *Comparison of the Ore Deposits of Långban, Sweden, with those of Franklin, New Jersey.* The Långban ores are briefly described by a quotation from a review of Magnusson's article together with a reprint of his paragenetic table. It is shown that not more than 16 of the very numerous minerals peculiar to this deposit are also found at Franklin and that these are not of great importance. The only common factor in the genetic histories of the two deposits is the formation of silicate skarns, at Långban caused by regional rise of temperature, at Franklin produced locally by intrusion of granite pegmatites.

A. A. PEGAU: *The Rutherford Mines, Amelia County, Virginia.* This paper deals with the geology and mineralogy of the pegmatites on which the Rutherford Mines are located. A recent survey has shown that the rare minerals, reported from the Amelia locality, are for the most part confined to these dikes. They are located in the Piedmont and are enclosed by a biotite gneiss of monzonitic composition. The texture of the pegmatite is determined by the chief mineral albite, which occurs as beautifully crystallized, platy, reticulated, fragile masses in the interstices of which occur many rare and unusual minerals. The texture of the near-by dikes is prevailingly graphic. A total of thirty-three mineral species have been reported from this deposit, while only a half dozen or so have been found in the other deposits in this area. This unusual texture and composition seems best explained as resulting from a replacement process in which potash feldspar has been replaced by soda feldspar, accompanied by the introduction of the rare minerals.

A. C. HAWKINS: *New and Unusual New Jersey Mineral Occurrences.* Covellite has been discovered at Schuyler Mine, Arlington, and is new to New Jersey. Natrolite from Millington in fine though small terminated crystals shows twinning on one of the pinacoids, probably *a*, like scolecite. Stilbite and heulandite occur in a very scoriaceous basalt at Summit in very good specimens. This is a little known locality.

C. S. ROSS AND E. V. SHANNON: *The Manganese Minerals of a Hydrothermal Vein near Sparta, North Carolina.* A hydrothermal vein located about 3 miles northeast of Sparta, North Carolina, and near the North Carolina-Virginia State line, contains an interesting group of minerals. The vein has evidently been formed by hydrothermal processes and contains a rather large group of hypogene silicates, carbonates and oxides. The most interesting of these are tephroite, a new manganese-aluminum spinel, rhodonite, manganese bearing carbonate, and two types of garnet. Associated with this are magnetite amphiboles and a few less abundant minerals. A subsequent period of mineralization has introduced quartz and sulphides.

W. T. SCHALLER: *Halite-anhydrite Intergrowths from Texas.* Intergrowths of large crystal units of halite and fine-grained anhydrite are present in some of the cores from the potash field of west Texas. The halite occurs in units that are six-sided in cross section. The shape of the units suggests that they may be pseudomorphous after a pre-existent unknown mineral.

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The joint session adjourned at 6 P.M. During the afternoon 9 papers were read by members of the Mineralogical Society and 4 papers were presented by members of the Society of Economic Geologists.

During the sessions of the Society a total of 32 scientific papers were presented. 41 fellows, 51 members and 16 guests registered at the meetings, making a total of 108, which exceeds all previous records of attendance. The following registered at the meetings:

H. L. Alling, Miss O. F. Apple, H. W. Arndt, R. Ballintine, H. M. Bannerman, Miss Florence Bascom, L. H. Bauer, W. S. Bayley, H. Berman, M. Billings, H. R. Blank, P. Bosch, N. L. Bowen, L. S. Brown, E. L. Bruce, A. F. Buddington, W. S. Burbank, J. D. Burfoot, Jr., B. T. Butler, E. Callaghan, Miss G. M. Carhart, Ian Campbell, R. J. Colony, C. S. Corbett, A. R. Crook, N. C. Dale, Miss R. A. Doggett, C. G. Doll, E. E. Fairbanks, C. R. Fettke, W. F. Foshag, R. B. Gage, E. K. Gedney, J. E. Gill, J. Gilluly, F. A. Gonyer, S. Gordon, C. K. Graeber, R. P. D. Graham, W. A. P. Graham, F. L. Grout, J. W. Gruner, A. C. Hawkins, F. L. Hess, D. F. Hewett, T. M. Hills, C. W. Hoadley, A. P. Honess, W. V. Howard, W. F. Hunt, W. A. Johnston, Jr., P. F. Kerr, J. D. Kraus, E. H. Kraus, G. F. Kunz, A. C. Lane, E. S. Larsen, J. V. Lewis, L. McI. Luquer, J. G. Manchester, J. H. C. Martens, E. B. Mathews, E. A. Maynard, B. L. Miller, C. E. Miller, R. B. Miller, E. S. Moore, J. P. Morton, W. M. Myers, G. W. H. Norman, F. M. Oldach, Charles Palache, A. L. Parsons, M. A. Peacock, A. A. Pegau, O. F. Pfordte, A. H. Phillips, R. S. Poor, H. A. Powers, L. S. Ramsdell, H. Ries, A. F. Rogers, C. S. Ross, J. J. Runner, E. Sampsom, W. T. Schaller, J. F. Schairer, H. Schneider, F. C. Schrader, M. W. Senstius, B. M. Shaub, M. N. Short, C. B. Slawson, Miss

I. F. Smith, C. H. Stockwell, M. H. Stow, J. L. Stuckey, S. Taber, E. Thomson, D. W. Trainer, Jr., G. Tunell, F. R. Van Horn, T. L. Walker, H. S. Washington, L. G. Westgate, E. P. Wheeler, 2nd, E. T. Wherry, and H. P. Whitlock.

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
1928 Esper S. Larsen

VICE-PRESIDENTS

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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
1928 Lazard Cahn

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

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1920. Arthur S. Eakle, Frank R. Van Horn, Fred E. Wright, Alexander H. Phillips.
1921 Frank R. Van Horn, Fred E. Wright, Alexander H. Phillips, Austin F. Rogers.
1922 Fred E. Wright, Alexander H. Phillips, Austin F. Rogers, Thomas L. Watson.
1923. Alexander H. Phillips, 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.
1928 William F. Foshag, William A Tarr, Alexander N. Winchell, Ellis Thomson.

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
1928 New York, New York.