

PROCEEDINGS OF THE TWELFTH ANNUAL MEETING OF THE MINERALOGICAL SOCIETY OF AMERICA AT TULSA, OKLAHOMA

FRANK R. VAN HORN, *Secretary.*

The Mineralogical Society of America held its twelfth annual meeting on December 29 and 30, 1931, in conjunction with the Geological Society of America, at the Mayo Hotel, Tulsa, Oklahoma, as guests of the Tulsa Geological Society, and the American Association of Petroleum Geologists. On Tuesday, December 29, at 2:00 P.M., President A. H. Phillips called the regular annual meeting to order. 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 107-119 of volume 16 (Number 3) of *The American Mineralogist*.

ELECTION OF OFFICERS AND FELLOWS FOR 1932

The Secretary announced that 176 ballots had unanimously been cast 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 1932 are the following:

*President:* Alexander N. Winchell, University of Wisconsin, Madison, Wisconsin.

*Vice-President:* Joseph L. Gillson, E. I. Dupont de Nemours & Co., Wilmington Delaware.

*Secretary:* Frank R. Van Horn, Case School of Applied Science, Cleveland, Ohio.

*Treasurer:* Waldemar T. Schaller, U. S. Geological Survey, Washington, D. C.

*Editor:* Walter F. Hunt, University of Michigan, Ann Arbor, Michigan.

*Councilor 1932-1935:* William J. McCaughey, Ohio State University, Columbus, Ohio.

The fellows elected follow:

Dr. Olaf Anderson, Research Laboratory, United States Steel Corporation, Kearney, New Jersey.

Dr. Richard C. Emmons, Assistant Professor of Geology, University of Wisconsin, Madison, Wisconsin.

Dr. James E. Hawley, Professor of Mineralogy, Queens University, Kingston, Ontario, Canada.

REPORT OF THE SECRETARY FOR 1931

*To the Council and Members of the Mineralogical Society of America:*

The Secretary herewith begs to report that the roll of the Society now consists of 115 fellows and 310 members in good standing, which is a gain of 37 over last year. One honorary life fellow, Professor Friedrich J. Becke; one fellow, Arthur S. Eakle and four members, A. C. Burrage, W. E. Biglowe, T. C. Crosby and T. A. Smith, have died during the year. In addition to the 425 fellows and members, there are 233 subscribers to the Journal, an increase of 19 over the previous year. Actually, during the past year, 3 fellows, 65 members and 29 subscribers, a total of 97, were added to the list, but deaths, resignations, with non-payment of dues and subscriptions, have reduced the mailing list by 2 fellows, 26 members and 8 subscribers, a total of 36, making a net gain in all classes for the year of 61. A total of 658 paid copies of *The*

*American Mineralogist* are mailed monthly, or a gain of 56 over last year. It is felt that the Society has increased quite satisfactorily over the previous year.

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

On motion, the report of the Secretary was accepted and ordered filed.

REPORT OF THE TREASURER FOR 1931

To the Council of the Mineralogical Society of America: Your Treasurer submits herewith his annual report for the year beginning December 1, 1930, and ending November 30, 1931.

RECEIPTS

|                                              |            |            |
|----------------------------------------------|------------|------------|
| Cash on hand December 1, 1930.....           | \$1,097.41 |            |
| Dues and subscriptions.....                  | 2,044.17   |            |
| Advertisements.....                          | 495.71     |            |
| Sale of back numbers.....                    | 197.70     |            |
| Interest on endowment and bank interest..... | 2,566.48   |            |
| Miscellaneous.....                           | 28.34      |            |
|                                              |            | \$6,429.81 |

DISBURSEMENTS

|                                                           |            |            |
|-----------------------------------------------------------|------------|------------|
| Printing and distribution of the Journal (12 issues)..... | \$3,795.62 |            |
| Printing and distribution of separates.....               | 283.98     |            |
| To the Editor, Secretary, and Treasurer.....              | 720.00     |            |
| Postage and stationery.....                               | 60.56      |            |
| Filing case and cards for Treasurer.....                  | 115.61     |            |
| Reprinting Volume 6.....                                  | 204.13     |            |
| Refunds on dues.....                                      | 16.00      |            |
| Safety deposit box.....                                   | 7.50       |            |
| Bank exchange on foreign checks.....                      | 1.69       |            |
|                                                           |            | 5,205.09   |
| Cash balance November 30, 1931.....                       | 1,224.72   |            |
|                                                           |            | \$6,429.81 |

The endowment funds of the Society as of November 30, 1931, are the same as a year ago, and consist of:

|                                                                                      |             |
|--------------------------------------------------------------------------------------|-------------|
| 45 \$1,000 bonds of the City and County of Honolulu, Water Works, 5%.....            | 45,000.00   |
| 4 Liberty bonds, \$100 each, 4th, 4 $\frac{1}{4}$ %.....                             | 400.00      |
| 4 \$100 bonds, Great Northern R.R., 5 $\frac{1}{4}$ %.....                           | 400.00      |
| 2 \$1000 bonds, Trenton Mort. and Title Guar. Co., 5 $\frac{1}{2}$ , due 1937.....   | 2,000.00    |
| 2 \$1,000 bonds, Trenton Mort. and Title Guar. Co., 5 $\frac{1}{2}$ %, due 1938..... | 2,000.00    |
| 1 \$1,000 bond, Denver Gas and Electric Light Co.....                                | 1,000.00    |
|                                                                                      | \$50,800.00 |

Respectfully submitted,  
W. T. SCHALLER, *Treasurer*

Early in December, at the request of the treasurer, President Phillips appointed an auditing committee consisting of Vice-President, W. F. Foshag, and two non-members of the Council, Frank L. Hess and E. P. Henderson, all of Washington, D.C., who reported as follows:

Washington, D.C., December 15, 1931

The auditing committee of the Mineralogical Society of America has examined the accounts of the treasurer and found them correct and in good order.

The bonds, as listed, are in the safe deposit box with all future coupons attached.

Frank L. Hess  
E. P. Henderson  
W. F. Foshag

#### REPORT OF THE EDITOR FOR 1931

*To the Council, Fellows and Members of The Mineralogical Society of America:* The present year concludes the sixteenth volume of *The American Mineralogist*. A cursory examination of the Journal during this period will reveal a considerable variation in size from year to year. On only three occasions, however, have volumes been issued that have totaled 600 pages. This goal was reached first in 1928, also in 1930, and again this present year. On the two previous occasions special issues were mainly responsible for these large volumes, while in the current volume the same result has been achieved through twelve regular numbers of fairly uniform size averaging approximately fifty pages each.

You will find in examining the list of fifty-one leading articles, which constitutes nearly 88 per cent of the total space of the Journal, practically every phase of mineralogy and crystallography represented. Thirteen articles have been classified as belonging to the division of descriptive mineralogy; eleven to chemical mineralogy; seven have stressed optical data; nine have been assigned to structural and two to geometrical crystallography; while addresses, memorials and articles of a miscellaneous character are represented by nine contributions. Included in the list are the detailed descriptions of four new minerals—schairerite, clarkeite, fermanite and krausite.

To those who might possibly question the propriety of publishing in the Journal certain manuscripts that were accepted this year, on the grounds that the organic compounds described were not minerals, I should like to call attention to Article 5 of the By-laws that provides that "The Society shall publish a Journal devoted to the advancement of mineralogy, crystallography and allied sciences." It is believed that all papers that have appeared this year came easily within the broad limits outlined by that general provision.

In a number of respects the current volume was quite unique. Of the fifty-one main articles, ten represented contributions from foreign countries—three from Germany, two from Sweden, two from England, and three from Canada. This is the largest number of manuscripts it has been our good fortune to receive from outside of the States for any one year period. During the past year fifty-six individuals representing thirty different universities, research bureaus, and technical laboratories have contributed one or more leading articles. These figures indicate in some degree the far-reaching service rendered by the Society's publication and the general interest shown in the Journal both here and abroad.

Aside from the longer contributions referred to, nine shorter articles have appeared under the division of Notes and News. Also, as in the past, considerable space was accorded to brief items of interest, book reviews, new mineral names and the proceedings of five Mineralogical Societies. In Volume 16 approximately 73 pages have been devoted to the items just enumerated. The volume has also been very profusely illustrated as is shown by the 198 illustrations distributed throughout the text.

At this point a suggestion might well be offered. The number of illustrations is mounting rapidly. An increase of forty-six was noted over that of a year ago. Due to the rather high cost of reproductions, it is urged that contributors restrict the number of cuts to those absolutely necessary. Any superfluous illustrations are an added burden upon the Society. Since the Council has been exceedingly liberal in granting 100 free reprints to authors, it might be suggested that this generous action should warrant somewhat greater economy in the number of cuts submitted, or at least a willingness on the part of the author to help defray the cost whenever the number of illustrations seems excessive.

A year ago the Council authorized the reprinting of Volume 6 (1921) as the surplus stock of that volume had become almost completely exhausted through the sale of back numbers. Two hundred additional copies have now been reprinted by a special photographic method at a cost of approximately \$200, so that we are now in a position to fill all orders that we are likely to receive for some time to come.

In the May issue of the *Mineralogist* a request was made for contributions to be used during the summer months. The response that followed was most gratifying and was reflected in the increased size of the last four issues of the Journal. It is hoped that this custom of completing all manuscripts before entering upon field work or other summer duties will be continued, for only by so doing can the size and character of the Journal be maintained during this otherwise lean period.

For the coming year an effort will be made to again issue a 600-page volume. This goal, in the light of past accomplishments, is not unreasonable and is one that our present financial income is able to underwrite.

Finally, no doubt many of our readers will be interested to learn that the *Mineralogist* is attempting to compile an up-to-date list of the more important mineral collections, both public and private, in the United States and Canada. Mr. Samuel G. Gordon of Philadelphia and Mr. Hugh S. Spence of Ottawa have been very active in this undertaking and considerable information has already been accumulated. It is thought that the work can be completed during the coming year and the data published in the Journal in the form of a regional directory.

The concluding table of contents summarizes the distribution of subject matter in Volume 16.

DISTRIBUTION OF SUBJECT MATTER IN VOLUME 16

| <i>Subjects</i>                  | <i>Articles</i> | <i>Pages</i> | <i>Per cent of Total</i> |
|----------------------------------|-----------------|--------------|--------------------------|
| Leading articles                 |                 |              |                          |
| Descriptive mineralogy.....      | 13              |              |                          |
| Chemical mineralogy.....         | 11              |              |                          |
| Optical crystallography.....     | 7               |              |                          |
| Structural crystallography.....  | 9               |              |                          |
| Geometrical crystallography..... | 2               |              |                          |
| Addresses, memorials, etc.....   | 9               |              |                          |
|                                  | 51              | 521½         | 87.8                     |

| <i>Subjects</i>                               | <i>Articles</i> | <i>Pages</i> | <i>Per cent of Total</i> |
|-----------------------------------------------|-----------------|--------------|--------------------------|
| Proceedings of societies.....                 | 21              | 40½          | } 12.2                   |
| Notes and news.....                           | 23              | 17½          |                          |
| Abstracted accounts of new mineral names..... | 10              | 6            |                          |
| Book reviews.....                             | 15              | 8½           |                          |
| Total of text.....                            | 120             | 594          | 100.0                    |
| Illustrations.....                            | 198             |              |                          |
| Covers, advertisements, index.....            |                 | 126          |                          |
| Total.....                                    |                 | 720          |                          |

Respectfully submitted,

WALTER F. HUNT, *Editor*

#### REPORT OF THE NEW COMMITTEE ON NOMENCLATURE AND CLASSIFICATION OF MINERALS

No progress has been made since the report presented at the last meeting of the Society, December 29, 1930. Owing to unexpected conditions, the Chairman was not able to submit the report to the members of the Society in 1931, but will do so early in 1932, for acceptance or rejection by the Society in December, 1932.

The committee asks that it be continued.

W. T. SCHALLER, *Chairman*

W. F. FOSHAG

E. S. LARSEN

J. F. SCHAIRER

T. L. WALKER

A. N. WINCHELL

It was moved, seconded and carried that the committee be continued.

#### REPORT OF THE REPRESENTATIVE ON THE NATIONAL RESEARCH COUNCIL

Several lines of research that are being pursued under the auspices of the Division of Geology and Geography of the National Research Council will be of interest to mineralogists.

An important report issued during the year is Bulletin 80, on "The age of the earth." This is an exhaustive investigation of methods and criteria for determination of geologic age. The parts discussing the studies of radioactive minerals will interest most mineralogists.

The committee on "Batholiths and mechanics of igneous intrusion" has prepared an exhaustive bibliography that will be useful to mineralogists as well as petrologists.

The subcommittee on "Criteria of paragenesis of ore minerals" has issued a final report, published in the September-October issue of *Economic Geology*. The criteria here discussed are primarily for the opaque ore minerals, but will be useful in all studies of mineral genesis and mineral sequence.

As usual, the report of the committee on "Sedimentation" contains abundant material of great value. All the different subjects reported upon can not be enumerated here, but the reports of progress, the reviews of papers, and the bibliographies contain material of the utmost usefulness.

The committee on "Potash-soda feldspars" reports that artificial members of the plagioclase series are being made which will permit much more accurate plotting of the optical properties.

The committee on the "Investigation of the clay minerals" reports a continuation of the studies of these minerals, and the publication during the year of a detailed report on "The kaolin minerals," by the U.S. Geological Survey.

CLARENCE S. ROSS

REPORT OF COMMITTEE ON COOPERATION WITH THE SECRETARY OF THE XVI INTERNATIONAL GEOLOGICAL CONGRESS, ALONG THE LINES OF MINERALOGY AND PETROLOGY

The committee has cooperated satisfactorily with the committee on excursions of the Sixteenth International Geological Congress. The excursions as now outlined embrace a satisfactory amount of mineralogical and petrological interest.

Since the Congress has been postponed until 1933, the committee suggests that it be continued so as to be available for any further cooperation that may be deemed desirable.

W. F. FOSHAG, *Chairman*  
 W. T. SCHALLER  
 J. F. SCHAIRER

It was moved, seconded and carried that the committee be continued.

NEW BUSINESS

It was moved by T. L. Walker and seconded by A. F. Rogers that the Society extend New Year's greetings to our Honorary Life Fellow, Professor Victor Goldschmidt of Heidelberg, Germany. The motion was carried.

At a meeting of the Council this morning it was voted that the Society have an official luncheon during the meetings, and the incoming president, Dr. A. N. Winchell was appointed to make arrangements. Dr. Winchell announced that such a luncheon would take place at 1:00 P.M., Wednesday, December 30, in the English room of the Mayo Hotel.

MEMORIAL BIOGRAPHIES

In view of the fact that none of the authors of the memorial biographies were present, and also that the articles will be printed in full in the Journal, it was moved, seconded and carried that they be read by title. They were as follows:

Memorial of Friedrich J. Becke (died June 18, 1931), by E. H. Kraus.

Memorial of Arthur S. Eakle (died July 5, 1931), by W. T. Schaller.

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:

AUSTIN F. ROGERS: *The Linear Projection in Geometrical Crystallography*. It seems advisable to use some generalized form of projection in elementary crystallography. The stereographic and gnomonic projection, excellent for advanced work, are hardly suitable for elementary classes, but in the linear projection of Quenstedt

we have a simple form of projection which is both convenient and useful. It probably furnishes the best method of bringing out the relations between faces and zones and may also be used for constructing clinographic drawings.

CLARENCE S. ROSS and E. P. HENDERSON, (read in abstract by the Secretary): *Variations in Optical Properties and Composition in the Anthophyllite Series*. A number of analyses of anthophyllites and ferroanthophyllites have been made and the optical properties determined. This permits a more accurate plotting of the variations of optical properties with variations in chemical composition. Some of the curves heretofore given have been based on the properties of an artificial magnesium end member. Such artificial material is now known not to be anthophyllite. Naturally occurring material has been used in all determinations in the present study.

ALEXANDER N. WINCHELL: *Ferrotremolite, Oxyhornblende, and Tourmaline*. The new names, ferrotremolite and oxyhornblende are suggested and explained. Following the work of Kunitz, the relations between chemical composition and optical properties in various kinds of tourmaline are shown by means of diagrams.

CHARLES PALACHE and W. F. FOSHAG, (read by Charles Palache): *The Chemical Nature of Joaquinite*. A chemical analysis of this incompletely described mineral shows it to be a titanosilicate of barium and sodium.  $\text{Na}_6(\text{Ba}, \text{Fe})_6\text{Ti}_{10}\text{Si}_6\text{O}_{61}$ . Its physical properties are described and its paragenesis and relations to other minerals of similar composition are discussed. It is orthorhombic, and has a density of 3.89. Its refractive indices are:  $\alpha = 1.748$ ,  $\beta = 1.767$ ,  $\gamma = 1.823$ .

W. T. SCHALLER (read by F. R. Van Horn): *Bavenite, a Beryllium Mineral, Pseudomorphous after Beryl, from California*. Bavenite from Mesa Grande, California, forms a pseudomorph after beryl. Bavenite contains about 3 per cent  $\text{BeO}$  and was identified in the mineral from Italy, as well as in the pseudomorphous mineral from California. The crystals from the two localities are almost identical in habit. The formula of bavenite is  $9\text{SiO}_2 \cdot \text{Al}_2\text{O}_3 \cdot \text{BeO} \cdot 4\text{CaO} \cdot \text{H}_2\text{O}$ . Spectrographic analyses show the presence of beryllium and the identity of Italian and Californian minerals.

CHARLES PALACHE and F. A. GONYER, (read by Charles Palache): *On Babingtonite*. Babingtonite from four new localities, all in Massachusetts, is described. Four new chemical analyses show an extraordinarily constant composition and lead to the formula  $\text{Ca}_2\text{Fe}''\text{Fe}'''\text{Si}_{14}(\text{OH})$ . The form, optical and other physical characters are shown to be essentially identical in all occurrences. Reasons are given for regarding babingtonite as not belonging either to the pyroxene group, the "triclinic pyroxene" group, or the feldspar group of minerals, in all of which it has been at one time or another classified. Rather it is to be considered as standing quite alone and without near relatives. Its paragenesis is discussed and it is shown to be characteristically a low temperature hydrothermal mineral.

HARRY BERMAN (read by Charles Palache): *Fibrous Brucite from Quebec*. Fibrous brucite or nemalite was identified in veins in the chrysotile asbestos deposits of Quebec. The fibers probably replaced earlier chrysotile. Optical study shows each lath-like fiber to be a hexagonal plate enormously distorted in the direction of one of the horizontal axes. The analysis shows it to be a brucite with a small amount of iron.

AUSTIN F. ROGERS: *Euhedral Gold Crystals from Mariposa County, California.* The North Duncan gold mine near Hornitos, Mariposa County, California, has furnished some noteworthy specimens of crystallized gold implanted on quartz. The gold occurs for the most part as cubo-octahedra modified by the trapezohedron (311). The crystals are rather small, but are very sharp and clear cut.

G. M. HALL: *Flattened Minerals in Muscovite at Spruce Pine, North Carolina.* The flattened minerals were collected in April 1931, from the Chestnut Flat Feldspar Mine near Spruce Pine, North Carolina. The flattened minerals are garnet, zoisite and magnetite, and they occur in books of mica in a pegmatite dike which consists essentially of orthoclase. The occurrence of zoisite in muscovite is uncommon, but the occurrence of the other two minerals is not. The magnetite contains unusual partings. Some of the crystals are so thin that they appear to be in minute openings between the cleavage planes of the mica, but other crystals are thicker and cleavage flakes of mica contain holes made by garnet and zoisite. The flattened minerals were apparently formed during the same period in which the mica crystallized.

KENNETH K. LANDES: *The Baringer Hill, Texas, Pegmatite.* The Baringer Hill pegmatite lies near the center of the Llano or Central Mineral Region about 100 miles northwest of Austin, Texas. The pegmatite is intruded into granite which in turn is intruded into pre-Cambrian metamorphic rocks. Baringer Hill is famous for its yield of rare earth minerals, especially gadolinite, cyrtolite, allanite, and fergusonite. But these and similar minerals constitute much less than one per cent of the total mass of the pegmatite. The most abundant minerals are quartz, microcline, and albite. All of the rare earth minerals and some of the other minerals were deposited by hydrothermal solutions, replacing older minerals.

F. R. VAN HORN: *The Spodumene Bearing Pegmatite from the Etta and Hugo Mines, Black Hills, South Dakota.* The writer visited these properties in July, 1931, and lantern slides are shown of the various open cuts which are about two miles south of Keystone, and twenty-two miles southwest of Rapid City. The Etta Mine has been known since 1880 as a mica mine, tin mine, and spodumene mine. It has long been famous for the size of the spodumene crystals. Schaller in 1904 mentioned one 47 feet long which should weigh 90 tons. No large crystals were seen in the open cut, and present mining is under ground. About 50 minerals have been found at the Etta.

The Hugo Mine, formerly called the Christianson, is working on two open cuts, and the same minerals are found as at the Etta, but amblygonite, which is a more desirable lithium mineral than spodumene, is found in greater amounts. Masses of 300-400 pounds are numerous. Minerals hand clobbered and saved for shipping were amblygonite, spodumene, yellow muscovite, and feldspar (microcline in my specimens). Columbite is found in masses up to 100 pounds.

W. A. TARR: *A Barite Vein in the Granite of Southeast Missouri.* A barite vein that cuts the pre-Cambrian granite of southeastern Missouri is described. The vein is narrow but well defined. The minerals are barite, pyrite and fluorite. The finding of this vein in granite settles an important question as to the origin of the barite in the nearby barite district. The origin and its significance was discussed.



After a discussion of this paper by O. R. Grawe, and a reply by Dr. Tarr, the Society voted to adjourn at 5:00 p.m., and to meet on Wednesday at 10:00 a.m., so that members might attend the general session of the Geological Society at 9:30 a.m.

\* \* \* \* \*

On Wednesday, December 30, at 10:05 a.m., President Phillips called the second session of the Society to order, and the reading of papers proceeded according to program.

FANNY CARTER EDSON: *Heavy Minerals as a Guide in Stratigraphic Studies.* Heavy minerals are one of the accepted means of stratigraphic correlation and they have served as an invaluable stratigraphic guide in Mid-Continent correlations. Proper well sampling and laboratory methods of analysis to correlate both surface and underground formations are explained. Important geological data that may be deduced from these analyses are suggested. The results obtained from the application of these methods to the study of sandstones of Ordovician age in the Mid-Continent oil field are discussed. These minerals are chiefly tourmaline, zircon, rutile and garnet.

EDWIN T. HODGE (read in abstract by the Secretary): *Petrographic Succession of Tertiary Igneous Rocks in Oregon.* Igneous activity began in Oregon in the early Paleozoic and has continued uninterrupted down to the present time. During the Tertiary, vulcanism has been the dominant process, sedimentary rocks making up less than 5 per cent of the formations. Tertiary vulcanism has been both intense and extensive. It may be said that Oregon is outstanding in the length, intensity, and extensiveness of its volcanic activity. Tertiary vulcanism has alternated between periods of widespread explosive and quiescent stages. These go in pairs. Between each pair there has been a period of deformation and erosion. The intensity of deformation and the length of the period of erosion has become decreasingly less so that in the Pleistocene vulcanism has proceeded on an unparalleled scale, and the Recent period gives promise of exceeding that of the Pleistocene. Publications on Oregon petrography are scattered and few. The paper presents, in a preliminary way, results of geologic mapping of the last ten years covering about one-tenth of the state, and representing samplings of many formations. It shows the pendulations back and forth between various magmatic poles. A quantitative statement of the various rock types will be presented.

EDWIN B. ECKEL (introduced by W. S. Burbank), read by W. S. Burbank: *Garnet as an Amygdale Mineral.* Near Ouray, Colorado, the intrusion of a gabbrodiorite stock has caused the development of garnet in the amygdules of andesite flows by contact metamorphism.

The original amygdale fillings consisted of chlorite, quartz, and calcite, with minor amounts of barite, chalcedony, and opal. Close to the intrusive body andradite garnet appears in some of the amygdules as rounded grains embedded in quartz and calcite, or as small trapezohedrons projecting into the openings. It is never found within the andesite, nor in non-amygdaloidal vesicles, such as are characteristic of some of the flows. It is believed that the garnet formed only as a replacement of calcite and other original minerals of the amygdules.

Some of the garnet was later replaced by epidote, which also replaced the original minerals of the andesite. The formation of the epidote was followed by a further generation of quartz.

The few known occurrences of garnet as an amygdale mineral are compared to that near Ouray and points of difference and similarity discussed.

EVANS B. MAYO (introduced by H. Ries), read by H. Ries: *Two New Occurrences of Piedmontite in California*. This rare mineral, probably first known to Cronstedt, who mentioned it as early as 1758, has since been found at several places in Europe, Egypt, India, Japan, and the United States. In this country it has been reported from at least five localities, two of which are in California.

A third Californian locality, in northeastern Madera County, near the summit of the Sierra Nevada, is here described, and the results of a study of two quite different occurrences of the mineral, namely, as a replacement of biotite in a meta-dacite, and as minute, acicular crystals in piedmontite-sericite schist, are given.

Inspection of a list of the known occurrences of piedmontite shows that the mineral is formed in quite a variety of geologic situations, apparently under conditions of thermal, or dynamo-thermal metamorphism.

AUSTIN F. ROGERS: *Sanbornite, a New Bariumdisilicate Mineral from Mariposa County, California*. Sanbornite is a triclinic mineral with perfect cleavage parallel to (001) and polysynthetic twinning parallel to (010). The indices of refraction are:  $n_\alpha = 1.597$ ,  $n_\beta = 1.616$ ,  $n_\gamma = 1.624$ , (all  $\pm .001$ ). It is optically negative with  $2V = 66^\circ$  (calculated from the indices). The optical orientation is  $Y$  nearly normal to (001) and the axial plane nearly normal to (010). The chemical formula is  $BaSi_2O_6$ . A probable structure with  $Ba_2Si_4O_{10}$  as the unit is given. It occurs in what is probably a contact metamorphic deposit (exact locality unknown) associated with quartz, diopside, tourmaline, pyrrhotite, gillespite, celsian (first reported occurrence in the U. S.), and several unknown minerals.

CHARLES PALACHE: *Zunyite from Guatemala*. Zunyite and specular hematite were found in graves in the ruins of Uaxactun, Guatemala. Zunyite was in crystals and the analysis showed the composition expressed by the formula  $Al_3Si_3O_{12}(OH.-F. Cl)_{12}$ . These minerals are shown to have probably been brought from volcanoes far to the south.

\* \* \* \* \*

The last paper was finished at 11:13 A.M., after which Dr. W. A. Tarr moved that the thanks of the Society be extended to the Tulsa Geological Society, to the American Association of Petroleum Geologists, and to the local committee for their kindness and hospitality. This was seconded by Dr. A. F. Rogers and carried. The Society then adjourned until 12:00 o'clock when it met in joint session with the Geological Society of America to listen to the presidential address of our retiring president, Dr. A. H. Phillips, on "Isomorphous Substitution of Elements in Minerals."

During the sessions of the Society, a total of nineteen scientific papers were presented, two being given in abstract. Thirty nine fellows, members and guests were present at the various meetings.

The following registered at the Tulsa meetings:

|                 |                |                  |
|-----------------|----------------|------------------|
| V. T. Allen     | O. R. Grawe    | F. H. Pough      |
| W. S. Bayley    | G. M. Hall     | H. Ries          |
| J. D. Barksdale | D. F. Hewett   | A. F. Rogers     |
| L. W. Barrett   | C. W. Honess   | E. Sampson       |
| M. Bear         | W. F. Hunt     | E. L. Spain, Jr. |
| W. S. Burbank   | J. H. Johnson  | L. W. Staples    |
| F. A. Burt      | K. K. Landes   | W. A. Tarr       |
| L. Cahn         | R. E. Landon   | F. R. Van Horn   |
| N. E. Chute     | A. C. Lane     | T. L. Walker     |
| W. H. Courtier  | E. B. Mathews  | S. Weidman       |
| F. C. Edson     | W. J. Miller   | T. W. Wilson     |
| R. C. Emmons    | C. Palache     | A. N. Winchell   |
| A. C. Giles     | A. H. Phillips | R. J. Wisner     |

## LUNCHEON MEETING

In accordance with a vote of the Council, a luncheon meeting was held on Wednesday, December 30, 1931, at 1 P.M. in the English Room of the Mayo Hotel. The meeting was presided over by Dr. A. N. Winchell, incoming president, and in order to get better acquainted with each other, he asked each one present to rise, give his name, present position, and hobby. The meeting was enjoyed by all and it was the general opinion that a similar meeting should be held each year.

## EXCURSION

Through the courtesy of Mr. George C. Branner, State Geologist of Arkansas, a field trip on New Year's Day was enjoyed by certain members of the Mineralogical Society and the Society of Economic Geologists. A special sleeper left Tulsa at 11:20 P.M., December 31, and arrived at Little Rock at 8:10 A.M., January 1. After breakfast in the Missouri Pacific station, seven autos carried the party to Magnet Cove, Hot Springs, the new cinnabar deposits near Amity, and finally to the peridotite diamond bearing pipe near Murfreesboro. Returning, the party arrived at Little Rock about 11:00 P.M., having traveled 275 miles during the day. On Saturday, January 2, Mr. Branner took a smaller party to visit the nephelite syenite stock at Fourche Mountain, and the bauxite deposits of the Republic Mining and Manufacturing Company, a subsidiary of the Aluminum Company of America, at Bauxite. Those participating are greatly indebted to Mr. Branner and his friends for their kindness. Members of the Society on the excursion were: W. S. Bayley, N. E. Chute, W. F. Hunt, P. F. Kerr, K. K. Landes, C. Palache, H. Ries, E. Sampson, and F. R. Van Horn.

## 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.

HONORARY PRESIDENT for Life.....Edward S. Dana, 1925

## PRESIDENTS

1920 Edward H. Kraus  
1921 Charles Palache  
1922 Thomas L. Walker

## VICE-PRESIDENTS

1920 Thomas L. Walker  
1921 Waldemar T. Schaller  
1922 Frederick A. Canfield

1923 Edgar T. Wherry  
 1924 Henry S. Washington  
 1925 Arthur S. Eakle  
 1926 Waldemar T. Schaller  
 1927 Austin F. Rogers  
 1928 Esper S. Larsen  
 1929 Arthur L. Parsons  
 1930 Herbert E. Merwin  
 1931 Alexander H. Phillips

1923 George F. Kunz  
 1924 Washington A. Roebing  
 1925 Herbert P. Whitlock  
 1926 George Vaux, Jr.  
 1927 George L. English  
 1928 Lazard Cahn  
 1929 Edward Wigglesworth  
 1930 John E. Wolff  
 1931 William F. Foshag

SECRETARIES

1920-1922 Herbert P. Whitlock  
 1923—— Frank R. Van Horn

TREASURERS

1920-1923 Albert B. Peck  
 1924-1929 Alexander H. Phillips  
 1929-1930 Albert B. Peck  
 1931—— Waldemar T. Schaller

EDITORS

1920-1921 Edgar T. Wherry  
 1922—— Walter F. Hunt

COUNCILORS

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. Win-  
 chell  
 1928 William F. Foshag, William A. Tarr, Alexander N. Winchell, Ellis Thomson  
 1929 William A. Tarr, Alexander N. Winchell, Ellis Thomson, Clarence S. Ross  
 1930 Alexander N. Winchell, Ellis Thomson, Clarence S. Ross, Paul F. Kerr  
 1931 Ellis Thomson, Clarence S. Ross, Paul F. Kerr, William S. Bayley

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  
 1929 Washington, D.C.  
 1930 Toronto, Canada  
 1931 Tulsa, Oklahoma