THE AMERICAN MINERALOGIST

JOURNAL OF THE MINERALOGICAL SOCIETY OF AMERICA

VOL. 5 JUNE, 1920 No. 6

ALFRED J. MOSES

LEA McI. LUQUER

Columbia University

Alfred J. Moses, Professor of Mineralogy in Columbia University, died on February 27, 1920, after a brief illness caused by cerebral hemorrhage. He passed away in his sixty-first year, in the full tide of his life's work, and by date of appointment was the Senior Professor in the Faculty of Applied Sciences.

Born in Brooklyn, New York, July 25, 1859, the son of Thomas Preston Moses and Margaret (Gaskell) Moses, he married first on June 23, 1887, Elizabeth Bacon Gilbert, and second on August 18, 1906, Margaret Carlton Magrath. He is survived by his widow, his sister Miss Louisa Moses, his married son, Alfred Staunton Moses and grandson, Alfred S. Moses, Jr., his daughter, Mrs. Margaret M. Fellows and his two younger sons, George M. and John H. Moses.

Professor Moses entered the School of Mines and graduated as an Engineer of Mines in the class of '82. His record as an undergraduate was brilliant, especially along mathematical lines. In 1890 he took his Ph.D. degree at Columbia University. Instead of pursuing his engineering career, he decided to accept an offer made by Professor Thomas Egleston, one of the founders of the School of Mines, to enter the Department of Mineralogy and Metallurgy as his assistant to succeed Dr. Colton. He became Adjunct Professor of Mineralogy in 1890, and, on the death of Professor Egleston in 1897, succeeded him as Professor of Mineralogy and in charge of the Mineralogical Museum. To prepare for this larger work, he spent a year abroad studying mineralogy with Professor Groth at Munich. After the move to the present site of the University, Professor Moses rearranged and enlarged the Mineralogical Museum on a new and more scientific basis. His special interest lay in the direction of mathematical crystallography and one of his chief aims was to bring the crystallographic side of mineralogy into more practical use by the students. As the demand in the great city of New York became pressing for a more scientific knowledge of gems in the jewelry trade, Professor Moses built up a scientific and at the same time a very practical course in gems, and added a most interesting collection of gems and gem minerals to the museum. His principal textbook, "Mineralogy, Crystallography and Blowpipe Analysis," now in its fifth edition (written in collaboration with Professor C. L. Parsons) has been eminently successful, especially for the use of mining and metallurgical students. In addition, in 1899, he brought out a textbook on the "Characters of Crystals" and in 1912 wrote the mineralogical part of the book, "Practical Field Geology," by Farrell and Moses. He was also the author of the article on crystals in the Encyclopedia Americana and prepared the section on mineralogy for Peele's Mining Engineers' Handbook.

Professor Moses was quiet and retiring in his disposition and never mingled much in the public meetings connected with mineralogy, but by his colleagues his sound judgment, sterling character, and accurate knowledge were fully appreciated. He carried on his work for many years with marked success and was a most faithful and persistent student. Due largely to conditions requiring highly specialized training of large classes of students, Professor Moses developed his success more as a teacher than as an investigator. The appended bibliography of his works will show, however, a considerable number of successful and painstaking investigations. As notable among them may be mentioned the description of the new mercury minerals in the Terlingua district of Texas and the naming of eglestonite after the former Professor of Mineralogy at Columbia. For many years he was also Managing Editor of the *School of Mines Quarterly*.

Bibliography

Tables for the determination of minerals. *School of Mines Quarterly*, **6**, 339–346.

Scheme for qualitative blowpipe analysis. *Sch. Mines Quart.*, **8**, 359–366.

Notes on blowpipe analysis. *Sch. Mines Quart.*, **10**, 320–326.

Summary of useful tests with the blowpipe. *Sch. Mines Quart.* **11**, 41–55; also in Furman's *Manual of Practical Assaying*, pp. 22–48.

Tables for the rapid determination of the common minerals. *Sch. Mines Quart.*, **11**, 334–355.

Alabandite from Tombstone, Arizona, and wavellite from Florida (with Lea McI. Luquer), *Sch. Mines Quart.*, **13**, 236–239.

Mineralogical Notes: (*a*) A probably new nickel arsenide (with E. Waller); (*b*) Graphite and magnetite pseudomorphs, *Sch. Mines Quart.*, **14**, 49–56.
Rapid qualitative examination of mineral substances (with J. S. C. Wells), *Sch. Mines Quart.* **14**, 25–39; *J. Analyt. Chemistry* **7**, 154–164.
Ettringite from Tombstone, Arizona, and pyrite crystals from King's Bridge, N. Y. *Am. J. Sci.* [3] **45**, 488–492.
Mineralogical notes: (*a*) Gangue of Arizona ettringite; gypsum crystals from Utah; heulandite and stilbite from Upper Montclair, N. J. *Sch. Mines Quart.* **14**, 323–329.
Ettringit und Alabandin von Tombstone, Arizona. *Z. Kryst. Min.*, **22**, 16–19.
Index to Mineralogical Literature, (with Lea McI. Luquer), *Sch. Mines Quart.* **15**, 163–179.
Simplified method for obtaining the "axial cross" of any crystal from any projection of the isometric axes. *Sch. Mines Quart.* **15**, 214–218.
Contributions from the Mineralogical Department: The pyramids of zincite; atacamite from Globe, Arizona; crystals of tartar emetic $C_4H_4O_6(SbO)K + \frac{1}{2}H_2O$; a notable specimen of enargite; hollow pseudomorphs of quartz after an unknown mineral. *Sch. Mines Quart.* **16**, 226–231.
Ueber eine einfache Vorrichtung zur Messung der Brechungs—exponenten kleiner Krystalle mittelst Total—reflexion, (mit E. Weinschenk), *Z. Kryst. Min.*, **26**, 150.
A simple apparatus for the measurement of the indices of refraction of small crystals by the method of total reflection (with E. Weinschenk), *Sch. Mines Quart.* **18**, 13.
A device for simplifying the drawing of crystal forms. *Am. J. Sci.* [4] **1**, 462–463.
Some new appliances and methods for the study of crystals. *Trans. N. Y. Acad. Sci.* **16**, 45–57.
Index to mineralogical articles with notes (with L. McI. Luquer), *Sch. Mines Quart.* **20**, 66–88, 194–210.
Mineralogical notes: Mercuric oxide from New South Wales. *Am. J. Sci.*, [4] **12**, 98–106.
Mineralogische Notizen: Quecksilberjodid von New South Wales; Neue Formen am Atacamit von Chile; Neue Formen am Pektolit von Bergen Hill; Realgar von Snohomish Co., Washington; Chrysoberyl von New York City; Pyroxenkrystall aus den Kupfergruben von Ducktown, Tenn. *Z. Kryst. Min.* **35**, Heft 5.
Professor Thomas Egleston. *Sch. Mines Quart.* **21**, 197–218.
Simple tables for the determination of the common or economically important minerals. *Sch. Mines Quart.* **21**, 192–193.
The Egleston Mineralogical Museum of Columbia University. *Eng. Mining J.* **69**, 407–408.
Notes on Recent Mineralogical Literature. *J. Applied Microscopy.* Extending over two years.
Formulae and graphic methods for determining crystals in terms of coördinate angles and Miller indices (with A. F. Rogers). *Sch. Mines Quart.* **24**, 1–36.
Eglestonite, terlinguaite and montroydite, new mercury minerals from Terlingua, Texas. *Am. J. Sci.* [4], **16**, 253–263.
Eglestonit, Terlinguaït und Montroydit, neue Quecksilber Mineralien von Terlingua in Texas. *Z. Kryst. Min.* **39**, Heft 1.
The crystallization of molybdenite. *Am. J. Sci.* [4], **17**, 359–364.
The crystallization of luzonite and other crystallographic studies. *Am. J. Sci.* [4], **20**, 277–284.
Formeln und Graphische Methoden zur Bestimmung von Krystallen auf Grund von Coordinatenwinkeln und Millerschen Indices, (mit A. F. Rogers). *Z. Kryst. Min.* **38**, Heft 3.
The determination of the geometrical constants of a crystal from its interfacial angles. *Sch. Mines Quart.* **27**, 432–460.
Guide to the sight recognition of seventy important minerals. *Sch. Mines Quart.* **31**, 355–380.

Some tests upon the synthetic sapphires of Verneuil. *Am. J. Sci.* [4], **30**, 271–274.
A scheme for utilizing the polarizing microscope in the determination of minerals of non-metallic luster. *Sch. Mines Quart.* **34**, 305–334.
Tables for the determination of gems and precious or ornamental stones without injury to the specimen. *Sch. Mines Quart.* **36**, 199–232.

THE GOLDSCHMIDT TWO-CIRCLE METHOD. CALCULATIONS IN THE ISOMETRIC SYSTEM

CHARLES PALACHE
Harvard University

Forms and Symbols[1]

In the gnomonic projection the center of the projection is occupied by the pole of the top face of the cube; direction lines towards the front and side faces give the coördinates. In figure 24 the poles of faces of one each of the seven holohedral forms are shown, complete for one octant. The cube face (010) is the zero meridian ($\varphi = v_0 = 0$).

Cube:

Index	Gdt.	φ	ρ
(001)	0	—	0 00
(010)	0∞	0 00	90 00
(100)	$\infty 0$	90 00	90 00

[1] The derivation of the Goldschmidt symbol from that of Miller has been explained in general terms on a previous page (Gnom. Proj., p. 72). The index symbol is divided thru by its last term, making the last term unity, which is omitted. The two resulting numbers, whole or fractional, constitute the Goldschmidt symbol. Some confusion is apt to result in the case of index symbols having the last term 0 and a few examples may help to understand the usage.

(123)	$\frac{1}{3}\ \frac{2}{3}\ \frac{3}{3}$	$\frac{1}{3}\ \frac{2}{3}$	(1)	$\frac{1}{3}\ \frac{2}{3}$
(112)	$\frac{1}{2}\ \frac{1}{2}\ \frac{2}{2}$	$\frac{1}{2}\ \frac{1}{2}$	(1)	$\frac{1}{2}$
(100)	$\frac{1}{0}\ \frac{0}{0}\ \frac{0}{0}$	$\infty\ 0$	(1)	$\infty\ 0$
(110)	$\frac{1}{0}\ \frac{1}{0}\ \frac{0}{0}$	$\infty\ \infty$	(1)	∞
(120)	$\frac{1}{0}\ \frac{2}{0}\ \frac{0}{0}$	$\infty\ 2\infty$	(1)	$\infty\ 2$
(230)	$\frac{2}{0}\ \frac{3}{0}\ \frac{0}{0}$	$2\infty\ 3\infty$	(1)	$\infty\ \frac{3}{2}$
(210)	$\frac{2}{0}\ \frac{1}{0}\ \frac{0}{0}$	$2\infty\ \infty$	(1)	$2\ \infty$

The meaning of the two-place symbol, pq, is this: a distance p is measured in the X coördinate direction, and from the point so reached a distance q is measured parallel to the Y coördinate direction. The point so established is the face-pole of pq. In systems other than the isometric the distances measured are pp_0 and qq_0 and the starting point is the coördinate center, which may not coincide with the center of the projection.

For prism faces the symbol means that the face-pole is infinitely distant along a line thru the coördinate center and a face-pole whose coördinates are given in the symbol. In the cases given above the face-poles are respectively 10, 11, 12, $1\frac{3}{2}$, 21.

Where the two figures of the symbol are identical, one only is written.