

Artificial hydrophilite is probably orthorhombic with a pseudo-tetragonal development, the isotropic material observed by Larsen being a compound of calcium chloride with the index liquids. The birefracting material which later develops along the borders of the isotropic compound probably represents a further reaction with the index liquid.

GREEN SPHALERITE FROM SONORA, MEXICO

R. J. LEONARD, *University of Arizona.*

Sphalerite of an unusually fine green color is prominently displayed in specimens of silver-lead ore recently received by the Department of Geology & Mineralogy, University of Arizona, from the Manzanal mine, near Cananea, Sonora, Mexico.

The sphalerite is massive cleavable, transparent, and varies in color between Ridgway's "Veronese" and "Rivage" greens, XVIII, 31', *d* and *b*, respectively. It occurs with galena in irregular segregations ranging up to one inch in greatest dimension; both are associated with small, prismatic quartz crystals in a gangue composed chiefly of massive quartz and included fragments of wall rock. The ore generally, judging by the specimens at hand, consists essentially of massive galena and tetrahedrite, with some brown sphalerite, in a quartz-barite and older, fragmental quartz-wall-rock gangue.

The period of crystallization of the green sphalerite and associated galena evidently was late in the formation of the deposit. Apparently they occur only in vugs or unfilled portions of a vein, and were deposited after the walls of such openings had been more or less lined with slender prismatic quartz crystals. The galena, partly massive cleavable, partly in distorted octahedral crystals, obviously was deposited first, as it commonly rests on and between the quartz crystals, with green sphalerite in turn on the galena. Occasionally, however, the order may be reversed, or sphalerite may be in contact with the quartz crystals, with little or no galena present. Some of the galena has a notably etched appearance. Sericite is abundant in all specimens and is conspicuously associated with the older gangue, while leverrierite is prominent in some as a heavy white coating on crystals of galena and quartz.

REVIEWS

MIKROSKOPISCHE PHYSIOGRAPHIE DER MINERALIEN UND GESTEINE. H. ROSENBUSCH, Vol. I, Second Half, 5th edition, enlarged and revised by Dr. O. Mügge. Octavo, pp. xvi, 814, with 221 figures, 35 plates and 17 double-page tabular summaries. E. Schweizerbart'sche Verlagsbuchhandlung, *Stuttgart*, published in three parts in 1925, 1926 and 1927. (For reviews of the First Half, see *Am. Mineral.*, VII, 1922, p. 211; IX, 1924, p. 172; and X, 1925, p. 155).

This well-known work is a very complete account of the microscopic characters of the rock-forming minerals. Mügge has retained the arrangement of the earlier editions so that minerals are described in the order of decreasing symmetry of the crystal systems to which they belong, while the order within each crystal system follows Groth's chemical classification. He has revised the fourth edition very thoroughly and also added greatly to the value of the work by more complete descriptions of the modes of occurrence of minerals and some discussions of their physico-chemical relations. He has also included many minerals not described in

earlier editions, especially those found in the deposits of salt lakes. The extent of the additions is indicated by the fact that the fifth edition is slightly more than twice as large as the fourth edition, and this increase is rather uniformly distributed in all parts of the work.

One of the features of the book is the abundance of references to the literature; these are assembled in lists at the end of each descriptive unit; for example, there is a list of 179 references at the close of the description of the monoclinic amphiboles. The bibliographies are very complete for German literature. The manuscript of the book was completed in the spring of 1924 and publications of later date in general are not mentioned.

Chemical analyses of minerals are given only in special cases, such as the amphiboles, for which formulas are somewhat unsatisfactory. Two of the plates are reproductions of Dr. Mügge's diagrams showing the relations between extinction angles and orientation of the section for tetragonal and hexagonal minerals. The author is to be congratulated upon the completion of a great work of reference.

A. N. WINCHELL

ATLAS DER LETZTEN LINIEN DER WICHTIGSTEN ELEMENTE.

FRITZ LÖWE. Abteilungsvorsteher im Zeiss-Werk. 44 pages and 16 plates of photographs. Verlag von Theodor Steinkopff. Dresden and Leipzig, 1928. Price 12 R.M.

In the booklet the author describes the method of making quantitative analyses for traces of elements by comparing the intensities of the lines in photographs of short-wave, persistent spectrum lines, obtained from the material under examination, with the intensities of the same lines in photographs of the spectra obtained with concentrations of the elements looked for, ranging from 0.001% to 1%. These percentages represent the number of grams of the respective elements in 100 cc. of solution of chloride.

The set up of the apparatus needed to produce the spark, the voltage of the primary alternating current, the capacity of the condenser and the dimensions of the self-inductance coil in the secondary circuit are given, as are also reproductions of 64 photographs of the portions of the spectra (mainly ultraviolet) which contain the lines used. Each photograph has a wave-length scale at the top and then in order, the lines of the dry carbon electrodes (ordinary lighting carbons are used), the lines from 1%, 0.1%, 0.01% and 0.001% solutions, and again those of the dry carbons. This arrangement shows clearly the changing intensities of the persistent lines. The elements covered in these photographs are Ag, Al, As, Au, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cu, Er+Y, Fe, Hg, Ir, K, La, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Pd, Pt, Sb, Si, Sn, Sr, Ta, Te, Th, Ti, Tl, V, W, Zn, and Zr.

In addition the book contains an extensive bibliography with discussion of some of the literature on the subject. At the end is a table of persistent lines in the order of increasing wave-lengths, stating for each line the element which gives rise to it, whether obtained by means of arc or spark, their intensities and the wave-length of the next line in the table, of the same element.

The book contains in compact form much that could, without it, be found only by extensive study of the literature on the subject and appears to be well worth a place in every chemist's library, especially of one interested in analytical chemistry.

D. M. LICHTY

SOIL MINERALOGY—A DISCUSSION OF MINERALOGY IN ITS APPLICATION TO SOIL STUDIES. FREDERICK A. BURT. vii+82 pages, 6 figures and 4 tables. D. Van Nostrand Co., Inc., *New York*, 1927.

In this small book of 82 pages the author, who has had considerable teaching experience in agricultural and engineering colleges, has attempted to fill a need for an elementary text for students of soils.

After introductory chapters dealing with the physical properties of minerals, the elements of soil minerals, and general principles covering the weathering of minerals, the major portion of the text is devoted to a description of 66 minerals which occur in soils. The effects of some of these minerals, harmful or beneficial to plant growth, are also referred to in some instances. Short tables are likewise included to illustrate the relative weathering resistance and volume changes of minerals during alteration, as well as for the determination of minerals.

The book should prove helpful to beginners in a short course on soil mineralogy, although a somewhat more adequate discussion of soils would have extended considerably the usefulness of this text.

W.F.H.

PROCEEDINGS OF SOCIETIES

PHILADELPHIA MINERALOGICAL SOCIETY

Academy of Natural Sciences, January 3, 1929

A stated meeting of the Philadelphia Mineralogical Society was held on the above date with the president, Mr. Trudell, in the chair. Forty-five persons, including twenty-six members, were present. The following were proposed by Mr. Cienkowski for junior membership: Messrs. Vincent Kleyla, Herbert Kurtz, William Leavitt, Harry Pollock, Lamar Witmer, Robert Morris and Alexander Flemeý.

A symposium on "quartz" constituted the program of the evening, under the direction of Mr. Charles Toothaker. Mr. Toothaker exhibited a fine series of crystals and introduced the subject with remarks on the general properties of the mineral, and its crystal forms. Mr. Boyle exhibited quartz from Hybla, Ontario, showing cracks developed by proximity to radioactive minerals. Mr. Trudell and Mr. Frankenfield exhibited specimens showing inclusions, both of other minerals and of liquids and gases. Messrs. Boyle and Biernbaum contributed remarks on the colors, and their causes, in amethyst and smoky quartz, and other varieties of this mineral. Mr. Gordon spoke on the members of the system SiO_2 ; α quartz, β quartz, α tridymite, β tridymite, α cristobalite, β cristobalite, and glass, and their stability.

The chair appointed judges to examine the exhibits made by the junior mineralogists of specimens gathered during the past year. First, second, and third prizes were awarded to Messrs. Day, Squiers, and Gottshalk, respectively.

SAMUEL G. GORDON, *Secretary*