

tinually leading to changes in long accepted values for other elements, as is illustrated by recent papers on aluminium¹ and on antimony.² The effects of these changes on the theoretical compositions of simple minerals are brought out in the following tabulations:

SILLIMANITE			STIBNITE		
At. wts. of Al	<u>27.10</u>	<u>26.96</u>	At. wts. of Sb	<u>120.20</u>	<u>121.77</u>
Per cent. Al ₂ O ₃	62.89	62.83	Per cent. Sb	71.42	71.68
Per cent. SiO ₂	<u>37.11</u>	<u>37.17</u>	Per cent. S	<u>28.58</u>	<u>28.32</u>
	100.00	100.00		100.00	100.00

It is plain that Dana's judgment was sound, for such changes in atomic weights affect even the first decimal place, so that the second, and even more the third, are quite meaningless. Only when the atomic weights of all the elements concerned in a mineral become known with greater finality than many of them are at present, will extension of the theoretical compositions beyond one decimal be justified.

E. T. W.

A real event in the mineralogical world has been the recent publication by the U. S. Geological Survey of *Bulletin 697*, "The microscopic determination of the nonopaque minerals," by Esper S. Larsen. We hope to have an extended review of this in an early number, but meanwhile advise every student of mineralogy to send for a copy to the Superintendent of Documents, Washington, D. C., the price being 30 cents (stamps not accepted).

We regret to note the death of Professor Albert Beutell, of the Technical School of Breslau, Germany, well known for his studies on the compositions of minerals, notably the cobalt-nickel arsenides and the zeolites.

On invitation of the Departments of Mineralogy and Geology of the University of Michigan, the next annual meeting of the Mineralogical Society of America will be held at Ann Arbor, Michigan, December 28 to 30, in conjunction with that of the Geological Society of America and other affiliated societies.

All petrographers will regret to hear of the death of Dr. Ernst Weinschenk, Professor of Petrography in the University of Munich. Dr. Weinschenk was the author of a number of books, three of which have been translated into English; *Anleitung zum Gebrauch des Polarisationsmikroskops*, *Die Gesteinbildenden Mineralien*, and the first volume of *Grundzüge der Gesteinskunde*.

ABSTRACTS—CRYSTALLOGRAPHY

A GROUPING OF THE THIRTY TWO CRYSTAL CLASSES. HERMANN TERTSCH, *Centr. Min. Geol.* **1916**, 145-154, 171-180.

The 32 crystal classes are grouped in 7 "grades" according to the symmetry of the crystal. The first two classes are made up of those crystals possessing only a polar or an alternating axis, respectively; the five other grades are derived by combining these with other symmetry operations.

EDW. F. HOLDEN

¹ Richards and Krepelka, *J. Am. Chem. Soc.*, **42**, 2221-2232, Nov., 1920.

² Willard and McAlpine, *J. Am. Chem. Soc.*, **43**, 797-818, April, 1921.

THE SYMMETRY OF ROENTGEN DIAGRAMS OF TRIGONAL AND HEXAGONAL CRYSTALS; AND NORMAL AND ABNORMAL DIFFRACTION IMAGES OF DOUBLY REFRACTING CRYSTALS. H. HAGA AND F. M. JAEGER. *Versl. Akad. Wet. Amsterdam*, 24, 443-459, 1916. 2. THE SYMMETRY OF ROENTGEN DIAGRAMS OF ORTHORHOMBIC CRYSTALS, *ibid.* 460-473. 3. OF MONOCLINIC CRYSTALS, *ibid.* 1135-1139. 4. OF TETRAGONAL CRYSTALS, *ibid.* 1403-1409. 5. OF ISOMORPHOUS CRYSTALS, *ibid.* 1410-1415. 6. THE SYMMETRY OF ROENTGEN DIAGRAMS OF TRICLINIC AND SEVERAL ORTHORHOMBIC CRYSTALS; AND NOTES ON THE DIFFRACTION IMAGES OF QUARTZ, *ibid.* 1612-1617; thru *Neues Jahrb. Min. Geol.*, 1918, Ref. 239-242.

An investigation of several artificial compounds and the following minerals: tourmaline, phenacite, dolomite, calcite, apatite, quartz, nephelite, penninite, anhydrite, aragonite, topaz, struvite, calamine, scolecite, gypsum, epidote, hornblende, augite, rutile, cassiterite, scheelite, wulfenite, strontianite, witherite, and cerussite.
E. F. H.

A SURVEY OF THE THEORIES OF ALLOTROPY. J. W. TERWEN. *Z. phys. Chem.* 91, 443-468, 1916; thru *Neues Jahrb. Min. Geol.* 1918, Ref. 253.

The Smits theory of allotropy, especially, is discussed. Many examples of allotropic modifications are cited to support it. This theory is that the allotropic modifications of a substance are mixed crystals of different compositions, in which two or more kinds of molecules are present in varying proportions.
E. F. H.

THE HABITS OF CALCITE FROM THE POLISH FORMATIONS. ST. KREUTZ. *Bull. Acad. sciences Cracovie* 1916, 172-189; thru *Neues Jahrb. Min. Geol.* 1919, Ref. 34-38.

This paper describes in detail calcite crystals from many Polish localities. These occur in formations from the Devonian to Eocene. No new forms are described.
E. F. H.

SULFUR AND BARITE FROM SWOSZOWICE. ST. KREUTZ. *Bull. acad. sciences Cracovie. Cl. sc. math. et nat. Ser. A; Sc. math.* 1916, 60-74; thru *Neues Jahrb. Min. Geol.* 1918, Ref. 130-132.

Sulfur crystals occurring with barite in beds in the Miocene at Swoszowice showed distinct natural etch figures, especially on p. (111) and n (011), but the symmetry was not clearly indicated.
E. F. H.

THE PRESENTATION OF CRYSTALLOGRAPHY AND ITS EMPLOYMENT IN GEOMETRIC INSTRUCTION. JULIUS RUSKA. *Natur. Naturw. Erdkunde Unterricht*, 1916, 449-461, 512-522, 564-575, 617-628; thru *Neues Jahrb. Min. Geol.* 1918, Ref. 239.

The author's experience, in the use of crystallography in relation to the teaching of geometry, is described.
E. F. H.

THE HEAPING-UP METHOD. E. A. WÜLFING. *Sitzb. Heidelberg Akad. Wiss., Math.-naturw. Kl.*, (1) 11, 28p. 1916; thru *Neues Jahrb. Min. Geol.* 1918, Ref. 109.

The author holds that to obtain true values for the angles between crystal faces a great number of crystals must be measured, and an average value found.
E. F. H.

NOTEWORTHY MINERALS, AND A NEW METHOD OF SPECIFIC GRAVITY DETERMINATION. JULIUS RUSKA. *Unterrichtsbll. Math. Naturw.*, 1916, no. 5; thru *Neues Jahrb. Min. Geol.* 1918, Ref. 237-238.

The author has obtained impossible forms and axial ratios for certain selected minerals, by perverting propositions in trigonometry and stereometry. In a similar way he has calculated the sp. gr. of sulfur to be 3. E. F. H.

THE SYMMETRY OF CRYSTAL ROENTGEN DIAGRAMS. M. v. LAUE. *Ann. Phys.* 50, 433-446, 1916; thru *Neues Jahrb. Min. Geol.* 1918, Ref. 111-112.

If the direction of the Roentgen ray incident on a crystal face be reversed, the direction of the refracted ray is similarly reversed; so that the figures obtained for the two directions must be congruent. The relation of this to symmetry in the crystal face is discussed. E. F. H.

THE DISTURBANCE OF THE STRUCTURE OF HOMOGENEOUS LIQUID CRYSTALS BY TWISTING. O. LEHMANN. *Ann. Physik.* (4) 51, 353-390, 1916; thru *Neues Jahrb. Min. Geol.* 1918, Ref. 254.

Twisting the solid while plastic affects the character of the resulting anisotropic liquid. E. F. H.

CRYSTALLIZATION STRENGTH AND LINEAR FORCE OF GROWING CRYSTALS. FRANZ E. SUSS. *Naturwissenschaft. Wochenschrift*, 15, 697-701, 1916; thru *Neues Jahrb. Min. Geol.* 1918, Ref. 238.

A summary of what is known on the subject. E. F. H.

AN ELECTROLYTE WITH COLLOIDAL AND CRYSTALLINE PHASES. HÅKAN SANDQVIST. *Koll. Z.* 19, 113-121, 1916; thru *Neues Jahrb. Min. Geol.* 1918, Ref. 253-254.

Solutions of bromphenanthren in sulfuric acid afford liquids having both isotropic and anisotropic phases. By mixing them with water, liquid crystals of all grades of viscosity up to viscous crystals were obtained by O. Lehmann.

E. F. H.

LIQUID CRYSTALS AND ANISOTROPIC LIQUIDS. W. VOIGT. *Phys. Z.* 17, 76-87, 128-135, 152-161, 305-307, 1916; thru *Neues Jahrb. Min. Geol.* 1918, Ref. 2.

A theory of liquid crystals is proposed. E. F. H.

THE OILY STREAKS IN LIQUID CRYSTALS. O. LEHMANN. *Phys. Z.* 17, 241-251, 1916; thru *Neues Jahrb. Min. Geol.* 1918, Ref. 3-4.

The "oily streaks" are caused by an unusual twinned arrangement of the molecules of the liquid crystal. E. F. H.

ANGLESITE FROM THE TINITIC DISTRICT, UTAH. E. H. KRAUS AND A. B. PECK. *Neues Jahrb. Mineral. Geol.* 1916, II, 17-30.

Anglesite occurs on quartz crystals in cavities in a siliceous rock which contains galenite. Sp. gr. = 6.350. The crystals are of four types; (1) prismatic, (2) pyramidal, (3) tabular, and (4) domatic. Two new forms λ (210) and Δ (441) were observed, as well as the doubtful forms R (12.13.156) and (450), which would be new for this locality. E. F. H.

DIASPORE FROM THE SIEBENGEIRGE AND THE ISLAND OF NAXOS. MARIA WATERKAMP. *Centr. Min. Geol.*, 1916, 522-525.

Diaspore occurs in transparent yellow crystals at Königswinter in the Siebengebirge in inclusions in a trachyte. They are tabular parallel to (100) and show

three new forms; α (706), β (796), and χ (201). Diaspore from the island of Naxos, probably an alteration product of corundum, occurs in bright transparent crystals which showed the new forms d (140), ϕ (350), g (27.2.11) and i (502). E. F. H.

STRENGITE FROM KIIRUNAVAARA—A FURTHER NOTE—AND DIASPORE FROM GELLIVAARA. R. KÖCHLIN, *Min. petr. Mitt.* 34, 1916; thru *Neues Jahrb. Min. Geol.* 1917, Ref. 283.

Strengite crystals, sp. gr. 2.86, colorless and transparent, show a (100), ϕ (111), and less often d (120). Two undetermined hydrous iron phosphates are noted, one of which, occurring in transparent red-violet crystals, sp. gr. 2.726, may be vilateite. Asparagus green diaspore, sp. gr. 3.408, is found in hematite at Gellivaara. E. F. H.

ABSTRACTS—MINERALOGY

THE DETERMINATION OF THE SPECIFIC GRAVITY OF MELTED SALTS AND THE TEMPERATURE COEFFICIENTS OF THEIR MOLECULAR SURFACE ENERGIES. F. M. JÄGER AND J. KAHN. *Versl. Akad. Wet. Amsterdam* 25, 284-300, 1916; thru *Neues Jahrb. Min. Geol.* 1918, Ref. 118-119.

A hydrostatic method of determining the specific gravity of melts at high temperatures is described. A platinum weight is immersed in the fusion. E. F. H.

THE EQUAL IMPORTANCE OF TiO_2 AND CO_2 , AS WELL AS SiO_2 AND CO_2 , IN ALKALI-, CALC-ALKALI, AND ALKALI-ALUMINATE MELTS. P. NIGGLI. *Z. anorg. allg. Chem.* 98, 241-326, 1916; thru *Neues Jahrb. Min. Geol.* 1918, Ref. 123-125.

The close relations between carbonates and titanates, as well as between silicates and carbonates, in compounds with the alkalies and alkali-aluminates, are given in this paper. E. F. H.

THE CARBONATES, II. HANS LEITMEIER. *Neues Jahrb. Min. Geol., Beil. Bd.* 40, 655-700, 1916.

The genesis of the carbonates of calcium, magnesium, and calcium and magnesium, is discussed. Aragonite is not distinguished from calcite by a small content of hydroxyl, as W. Vaube suggested. Lansfordite from the mineral water at Rohitsch Sauerbrunn in Steiermark showed the indices; $\alpha=1.4559$, $\beta=1.4755$, $\gamma=1.5023$. Results of experiments on the solubility of magnesite and dolomite in carbonated waters are given. E. F. H.

SIMPLE GLIDING IN HAUSMANNITE AND ITS OPTICAL CHARACTERS. O. MÜGGE. *Centr. Min. Geol.* 1916, 73-78.

Hausmannite from five localities showed twinning lamellae parallel to (101), and crystals from Öhrenstock exhibited gliding phenomena. Sections parallel to (001) show it to be uniaxial, with strong birefringence and brownish red color. E. F. H.

MAGNETIC PROPERTIES OF HEMATITE. T. F. SMITH. *Phys. Rev.*, 8, 721-737, 1916.

An investigation of hematite from several localities shows that it possesses a magnetic symmetry axis, magnetism being equally strong in all directions perpendicular to the axis, and much weaker in that of the axis. E. F. H.