## ABSTRACTS—MINERALOGY

CELESTITE AND STRONTIANITE. Frank L. Culin. Arizona Univ., Bur. Mines, Bull. 35, Oct., 1916.

A detailed description of celestite and strontianite, with chemical tests, uses, methods of extracting and purifying, and summary of the various occurrences in the United States. L. S. Ramsdell, W.F.H.

COPPER. P. E. Joseph. Arizona Univ., Bur. Mines, Bull. 37, Oct., 1916.

Describes physical properties, tests and occurrences of native copper, chalcocite, bornite, chalcopyrite, enargite, tetrahedrite, cuprite, malachite, azurite and chrysocolla. Aso brief account of their origin. Descriptions of various Arizona districts, including Bisbee, Globe, Morenci and several others. L.S.R., W.F.H.

THE TSCHERMAK METHOD OF INVESTIGATING THE FORMULAS OF THE ACIDS ENTERING INTO SILICATES. G. Césaro. *Riv. min. crist. Ital.*, **49**, 44–46, 1917.

The Tschermak method [which consists in treating the silicate with acid and determining the composition of the silicic acid liberated after bringing it to certain standard conditions] is favored; and its indication as to the composition of olivine as $Mg_2O.SiO_3$ is accepted. [This method is based on the theory that colloids have definite compositions, which is not held by most present-day chemists. Abstr.] E.T.W.

NEPHELINE FROM PARCO CHIGI, ARICCIA, MONTI ALBANI. F. Stella Starrabba. *Riv. min. crist. Ital.*, **48**, 52–64, 1917.

Small colorless crystals of nephelite occur in cavities in a metamorphic rock, composed mainly of biotite. They show the forms: (0001), $(10\bar{1}0)$, $(11\bar{2}0)$, $(20\bar{2}1)$, and $(10\bar{1}1)$. The specific gravity is 2.65; refractive indices: $\omega_D$ 1.5417, $\epsilon_D$ 1.5382; data for other wave lengths are also given. By plotting analyses in a triangular diagram it is shown that nephelite is a solid solution of $Na_2Al_2Si_2O_8$ and $Na_2Al_2Si_3O_{10}$, with some replacement of Na by Ca and K. E.T.W.

CANCRINITE, ITS FORMULA, ITS BIREFRINGENCE, AND ITS NONEXISTENCE AT MONTE SOMMA. G. Césaro. *Riv. min. crist. Ital.*, **48**, 65–79, 1917.

A highly complex [and improbable. Abstr.] formula is derived. Reports that this mineral occurs at Monte Somma are considered to be unfounded. E.T.W.

THE RECENT ARTICLE BY CÉSARO ON CANCRINITE AND ITS NONEXISTENCE ON MONTE SOMMA. F. Zambonini. *Riv. min. crist. Ital.*, **49**, 90–93, 1917.

It is pointed out that if cancrinite is defined as a group of minerals with a certain range of composition, it certainly exists on Monte Somma. E.T.W.

CONTRIBUTIONS TO THE STUDY OF THE NATURAL SULFOSALTS, 2. THE IDENTITY OF SYCHNODYMITE WITH CAROLLITE. 3. THE CHEMICAL COMPOSITION OF ARGENTOPYRITES.

F. Zambonini. Univ. Torino. *Riv. min. crist. Ital.*, **47**, 40–60, 1916; abstr. reprinted by permission from *Chem. Abstr.*, **13** (17), 1991, 1919.

The analyses which have been made of these and related minerals are discussed at length, and the possible presence of inclusions is pointed out. It is concluded that there is a linneite group, containing the minerals: linneite, $(Co, Fe)Co_2S_4$, polydymite or nickelo-linneite, $(Ni, Fe)Ni_2S_4$, carrollite, $CuCo_2S_4$, and daubreelite, $FeCr_2S_4$. [The abstractor doubts the correctness of the inclusion of the last two, because "carrollite" has been found upon mineralographic examination by Murdoch to be a mixture; and daubreelite has a single cleavage direction and hence must belong in another crystal system than cubic.]

The unsatisfactory data available on sternbergite, argyropyrite, frieseite, argentopyrite, etc., are discussed, and it is pointed out that all the analyses can be interpreted as essentially $AgFe_2S_3$ with small amounts of excess FeS and S. By analogy with pyrrhotite, one form of which is crystallographically close to these minerals, it is suggested that these excess constituents are present in solid solution. [A highly probable explanation. Abstractor.]
E.T.W.

THE ARGENTOPYRITES. G. Césaro. *Riv. min. crist. Ital.*, **49**, 3–43, 1917.

Previous theories of the constitution of these minerals are reviewed, and a new mathematical theory is proposed, according to which the general formula is $Ag_aFe_fS_s = Ag_aFe_f(S_2)_{s-(f+\frac{1}{2}a)}S''_{a+2f-s}$. [This represents an extreme development of the older view that minerals necessarily have definite formulas. The modern view applied to these minerals by Zambonini (see abstract above). that many cases of apparent complexity in composition are due to analyses having been made on impure material, but that excess components when not admixed are present in solid solution, seems preferable. Abstr.] E.T.W.

NEW OBSERVATIONS ON MOLYBDENITE AND OTHER MINERALS FROM ZOVON, EUGANEI. E. Billows. *Riv. min. crist. Ital.*, **49**, 49–89, 1917; abstract reprinted by permission from *C.A.* **13** (18), 2168, 1919.

An elaborate statistical study of the occurrence and associations of the minerals in 450 specimens of "geodes" (vugs) in trachyte. The inferred paragenesis is: (1) quartz and pseudotridymite; (2) calcite and siderite; (3) pyrite and molybdenite; (4) molybdite, limonite, a mineral related to celadonite, and siderite pseudomorphous after pyrite; and (5) magnetite, biotite, ilmenite variety iserine, and pyrolusite.
E.T.W.

ARTIFICIAL PERICLASE, AND THE PROBABLE GENESIS OF THE PERICLASE OF MONTE SOMMA. G. Césaro. *Riv. min. crist. Ital.*, **48**, 80–81, 1917.

It is suggested that volcanic gases containing HCl acted on the Mg-bearing rocks of Monte Somma, forming $MgCl_2$, which was subsequently decomposed, yielding crystalline MgO.
E.T.W.

CONTRIBUTION TO THE STUDY OF THE MINERALS OF VESUVIUS AND MONTE SOMMA. G. Césaro. *Riv. min. crist. Ital.* **48**, 3–52, 1917.

*The humite group*: Specimens containing members of this group were studied in the laboratory of mineralogy of the University of Cambridge. (One circle measurement used.) A rapid method for finding which member of the group is represented by a given crystal is: Find the zone ph′(001) (100), which is always well developed, and the faces of which are striated parallel to the zone axis; An angle in this zone of 71° indicates chondrodite, 79° clinohumite, and 76° humite. The base can usually be recognized by being more or less hexagonal, and elongated in the *y* direction. The refractive indices and optical orientations (tabulated) are also characteristic. Tables of angles for each species are given. The results of measurement of a number of crystals of each species are tabulated, in comparison with the theoretical angles, in some cases according to two different orientations. The associated minerals are described also, with measurements of one crystal of forsterite, and of negative davynite.

*Sarcolite*: This is associated with augite, pyrrhotite, wollastonite, apatite, a variety of nephelite, and humboldtilite; some measurements of the last are given. The sarcolite crystals are colorless to pale yellow, and 2–4 mm. in diameter. Some have the usual forms as figured in Dana's System; others have peculiar angular relations. These are discussed mathematically, and a provisional interpretation is reached. Some apparently new forms are present, $b^2$(102) and $b^7$(017), and on another crystal $a^{17}$(1.1.17).

*Mineral of the nephelite group*: This is unusual in possessing both basal and prismatic cleavage, and a double refraction between that of davynite and kaliophilite, negative, 0.035. *Pleonaste*: This is of octahedral habit, with the rare form (771). E.T.W.

## VIRIDINE AND ITS RELATION TO ANDALUSITE. E. A. WÜLFING. *Sitzb. Heidelberg Akad. Wiss., abh.* 12, 1917; *Neues Jahrb. Min. Geol.,* **1918**, I, Ref. 259–261; thru *J. Chem. Soc.*

Certain green, red and greenish yellow andalusites have been called viridine or manganandalusite, and contain up to 10 percent. $Fe_2O_3$ and $Mn_2O_3$, so that their formula is $(Al,Mn,Fe)_2SiO_5$. These are found to be optically + with $\gamma = c$, whereas andalusite proper is — with $\alpha = c$. Viridine is therefore believed to be a distinct species, representing a fourth polymorphous form of $Al_2SiO_5$. E.T.W.

## THE RÔLE OF BORON IN SILICATES. G. CÉSARO. *Riv. min. crist. Ital.*, **50**, 3–31, 1918.

The boron in silicates is believed to function as an acid, the group $B_2O$ replacing Si in many cases. Highly complex formulas are derived for various minerals on this basis. E.T.W.

## MINERAL FORMATION IN A BASALT. G. PANEBIANCO. *Riv. min. crist. Ital.*, **50**, 50–73, 1918.

Includes brief descriptions of calcite, quartz, and pyrite crystals, with notes on their formation. E.T.W.

## THE DEGREE OF APPROXIMATION OF THE CALCULATIONS IN CHEMICAL ANALYSES. C. PANEBIANCO. *Riv. min. crist. Ital.*, **50**, 32–49, 1918.

A mathematical discussion of the accuracy attainable in mineral analyses. E.T.W.