CHEMICAL PROPERTIES: Formula, $(Y,Er)(PO_4)(H_2O)_2$ with Y:Er = 5:1. Theory: R_2O_3 54.1, P_2O_5 30.5, H_2O 15.4, sum 100.0%. Analysis gave: R_2O_3 52.47, P_2O_5 30.20, Fe_2O_3 0.24, insol. 0.38, loss on ign. 16.42, sum 99.71%. Mean atomic weight of rare earths (R) = 102; methods of analysis are described in detail; small amounts of other rare earths are present.

In the closed tube yields water, but no fluorine. Infusible; heated with cobalt solution becomes dark. Readily soluble in dilute acids, but not in alkalies.

PHYSICAL PROPERTIES: Color white; form, matted globular masses, also radiated needles. Closely resembling wavellite, but found by Laubmann to be optically distinct (no data given).

OCCURRENCE: As a coating on limonite iron ores in the Amberg-Auerbach mine, Bavaria. An associated mineral containing much less rare earths is called by Dr. Laubmann "pseudo-wavellite."

REMARKS: Evidently a new species, although the incomplete description is to be regretted. E. T. W.

CLASS: PHOSPHATES, ETC. DIVISION: $R'':R''':P:H_2O = 4:4:6:27.(?)$.

Vauxite

S. G. GORDON: See *Am. Min.*, **7**, (6), 108, 1922; *Science*, **56**, 50, 1922.

CLASS: PHOSPHATES, ETC. DIVISION: $R'':R''':P:H_2O = 1:2:2:11.(?)$.

Paravauxite

S. G. GORDON: *loc. cit.* E. T. W.

ABSTRACTS: CRYSTALLOGRAPHY

THE OPTICAL PROPERTIES OF EPIDOTE. M. GOLDSCHLAG. *Tscher. Min. Petr. Mitt.*, **34**, 23-60, 1917; through *Mineralog. Absts.*, **1**, 346.

The following minerals were examined: (I)Clinozoisite, wine-yellow crystals from the Schwarzenstein Alp, Zillerthal, Tyrol; (II)Olive-green epidote from Pfarrerb, Zöptau, Moravia; (III)Pistachio-green epidote from the Knappenwand, Sulzbachthal, Salzburg; (IV)Deep-green pistazite from Rauhbeerstein, Zöptau. The results were:

	Iron-epidote molecule	α	β	γ	2V (over α)	$\alpha:c$
I.	0%	1.7136	1.7172	1.7188	113°47′	+12°17′
II.	22	1.7217	1.7422	1.7500	80 15	− 2 05
III.	34	1.7262	1.7569	1.7737	73 06	− 4 28
IV.	37	1.7291	1.7634	1.7796	68 53	− 4 53

These and others from the literature are tabulated to show the variation of optical properties (Na light) with the amount of the iron-epidote molecule. E. F. H.

THE BINNENTHAL DOLOMITE, ITS CRYSTAL FORMS, INDICES OF REFRACTION, AND ETCH PHENOMENA. PAUL KOLLER. *Neues Jahrb. Min. Geol.*, Beil.-Bd. **42**, 457-98, 1918; through *Mineralog. Absts.* **1**, 350.

Four types of crystals are described. On the colorless transparent crystals 35 forms are noted. Striations, etch figures, and several third order rhombohedrons show the symmetry. For crystals with $FeCO_3 = 0.09$-0.13%, the indices were: ω_ρ 1.6733, ω_{Na} 1.6799, ω_ν 1.7030, ϵ_ρ 1.4984, ϵ_{Na} 1.5013, ϵ_ν 1.5110. Sp. gr. 2.882.

Etch-figures on the cleavage of magnesite show the same symmetry as those of calcite, but in reversed position. E. F. H.

CRYSTAL GROWTH AND CHEMICAL AFFINITY. J. J. P. VALENTON. *Physik. Z.*, **21**, 606-9, 1920.

The assumption is made that atoms in undissociated molecules and in crystals possess residual electrostatic charges. Therefore, the atoms in the outer layer of a growing crystal exert an effect into the solution, attracting atoms of unlike sign and repelling those of like sign. The cube faces of NaCl have both + and – atoms arranged in checkerboard fashion. Midway between the atoms the field is neutral. The growth normal to these faces should be slow. The (111) faces represent an opposite extreme for all atoms in any one net plane have the same kind of charge and there is no neutral field. Normals to these faces should be directions of rapid growth. Prominent crystal faces are those of slow growth, hence cubes are common for NaCl. OTTO VON SCHLICHTEN

IS THE MANNER OF ATTACHMENT OF A CRYSTAL TO ITS SUPPORT DETERMINED BY SOME LAW, OR IS IT ACCIDENTAL? GEORGE KALB. *Centralbl. Min.*, 65-67, **1920**.

K. presents a tabulation of the mode of attachment of a series of minerals to their support, data taken from current textbooks on mineralogy. The fact is brought out that needle-shaped, bladed and prismatic crystals are attached with their longer dimension normal to their support, while platy crystals are attached by an edge. This is true even if the support is non-crystalline. K. concludes: (1) that "crystals have a tendency to attach themselves to their supports so that a predominating rational direction is normal to the support." NaCl crystallizes from an aqueous solution in cubes which are attached to the sides and bottom of the vessel by their cube faces. Crystallizing, however, from a NaOH solution the cubes are so attached that a trigonal axis stands normal to the support. (2.) "The plane of attachment is a crystal face having a high surface tension." (3.) "Crystals that are permitted to grow undisturbed assume a position of equilibrium with respect to their support, which is determined by their surface tension.

OTTO VON SCHLICHTEN

ON THE OCCURRENCE OF COTUNNITE, ANGLESITE, LEADHILLITE, AND GALENA ON FUSED LEAD FROM THE WRECK OF THE FIRE-SHIP 'FIREBRAND' IN FALMOUTH HARBOUR, CORNWALL. ARTHUR RUSSELL. *Mineral. Mag.*, **19**, (90), 64-68, 1920.

Numerous well developed crystals were found on the surface and in the interstices of cavernous masses of metallic lead. *Cotunnite* ($PbCl_2$); the crystals which are up to 3 mm. in length are generally elongated parallel to the *a* axis. No evidence of twinning was detected. The following eight forms were observed: (010); (001); (021); (011); (012); (101); (111); (112). *Anglesite;* these were rectangular in habit, colorless to black, and attained a length of 5½ mm. The forms noted were: (100); (001); (110); (011); (102); (122); (113). *Leadhillite;* forms thin, six sided plates with a diam. of about 1 mm. In most cases the images were poor but 8 forms were positively identified; (101); (201); (101); ($\bar{2}01$); (112); (111); ($\bar{1}12$); ($\bar{1}11$). W. F. H.