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this species, and in accounting for their similarity of crystallization, deduces as follows their atomic volumes.—(Pogg. Ann., lxxxi, 31.)

	Formulas of Tourmaline.		Mean atom. vol.
I.	$\dot{R}^3(\overline{Si}^2, \overline{B}^3)+3\bar{R}(\overline{Si}, \overline{B})$	- - -	1808
II.	$\dot{R}^3(\overline{Si}^2, \overline{B}^3)+4\bar{R}(\overline{Si}, \overline{B})$	- - -	2217
III.	$\dot{R}^3(\overline{Si}^2, \overline{B}^3)+6\bar{R}(\overline{Si}, \overline{B})$	- - -	3013
IV.	$\dot{R}(\overline{Si}, \overline{B})+3\bar{R}(\overline{Si}, \overline{B})$	- - -	1464
V.	$\dot{R}(\overline{Si}, \overline{B})+4\bar{R}(\overline{Si}, \overline{B})$	- - -	1850

He then observes that the numbers 1464, 1808, 1850, 2217, 3013, have the relation (correcting his 1·25, by substituting 1·26)

$$1 : 1{\cdot}24 : 1{\cdot}26 : 1{\cdot}51 : 2{\cdot}06,$$

or very closely

$$1 : 1\tfrac{1}{4} : 1\tfrac{1}{2} : 2 = 4 : 5 : 6 : 8.$$

But let us now divide these numbers by the number of atoms of the elements, and we shall find the atomic volumes, as thus deduced, very closely equal.

		No. of atoms.	Atomic vol. ÷ No. of atoms.		Atomic vol. deduced.
Formula	I.	41*	1808 ÷ 41	=	44·1
"	II.	50	2217 ÷ 50	=	44·34
"	III.	68	3013 ÷ 68	=	44·31
"	IV.	33	1464 ÷ 33	=	44·36
"	V.	52	1850 ÷ 42	=	44·05

This equality is certainly very remarkable, and the identity of crystallization is attributed to it with good reason.

We also remark that the number of atoms 33, 41, 42, 50, 68, have to one another the ratios

$$1 : 1{\cdot}24 : 1{\cdot}27 : 1{\cdot}51 : 2{\cdot}06,$$

which are coincident, as will be observed, with the ratios obtained by Rammelsberg for the atomic volumes. *The ratios* 4 : 5 : 6 : 8, which this chemist deduces, *are in fact therefore only the ratios of the number of atoms*, 33 : 41 : 50 : 68.

ART. XXIV.—*Mineralogical Notices.* No. III.

1. *New Species.*

Gurolite, a new mineral; T. ANDERSON, (Phil. Mag. [4], i, 111.)—Occurs on Skye, at Storr, nine miles from Portree, in basalt; it is associated with apophyllite, stilbite and laumonite, though found in the finest specimens where these minerals do not abound. The name *gurolite* (more correctly *gyrolite*,) alludes to the spherical

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* In the first formula, $\dot{R}^3$ contains 6 atoms or molecules; $\overline{Si}^2$, 8; $3\bar{R}$, 15; $3\overline{Si}$ 12; making in all 41.

form of its concretions, and is from γυρος, *orbiculatus*. Structure radiating, and surface of the concretions appearing striated owing to the plates of which it is formed rising to irregular distances above the surface; cleaves easily parallel to the plates. Color white; lustre vitreous, passing into pearly on exposure; perfectly transparent in thin plates. Very tough. Hardness between 3 and 4. B.B. yields water, swells up and separates into thin pearly or silvery plates. On charcoal swells up, splitting into thin laminæ and fuses to an opake enamel. With borax, yields a transparent colorless glass; with soda fuses with difficulty to an opake mass. Readily attacked by hydrochloric acid.

Composition according to T. Anderson,

	$\dddot{Si}$	$\bar{Al}$	$\dot{Ca}$	$\dot{Mg}$	$\dot{H}$
	50·70	1·48	33·24	0·18	14·18=99·78
Oxygen	26·86		9·49		12·60

He thence deduces the oxygen ratio for the lime, silica and water, (considering the other ingredients as unessential,) 1 : 3 : 1½, and the formula $2\dot{Ca}\dddot{Si}+3\dot{H}$. The formula requires a little less lime and more silica and water, which discrepancy Mr. Anderson attributes to partial efflorescence. The ratio of lime and silica is the same as in Edelforsite. Its efflorescence and crystallization in plates distinguish it from dysclasite.

Aræoxene, a new vanadate of Lead and Zinc.—KOBELL received this new mineral through Prof. Döbner. It was found at Dahn in the Palatinate, with galena, and had been considered a chromate of lead. It occurs massive but imperfectly crystalline, with some traces of a columnar structure. Color red, darker than crocoisite, with a brownish tinge; streak pale yellowish. H.=3. B.B. on coal fuses easily with intumescence, and yields an arsenical odor with a globule of lead, the latter being larger with soda. With borax fuses in the reduction flame to a bright green glass, which in the oxydation flame becomes gradually light olive green, then clear yellow, and on cooling changes to a pale greenish tint. Heated with concentrated muriatic acid, the powder easily decomposes, and the liquid is first yellow, then brownish, and after giving out chlorine, emerald green. On adding spirits of wine, heating it, and pouring off from the solution the separated chlorid of lead, it is still green; but on concentrating it by means of a vapor bath and then diluting it with water it takes a fine sky-blue color. In this characteristic, it is like other allied vanadium compounds. Von Kobell found in the mineral 48·7 p. c. of oxyd of lead and 16·32 of oxyd of zinc. The vanadium lead ore analyzed by Damour contained only 6·34 p. c. of oxyd of zinc. —(J. f. pr. Chem., l, 496.)

Enargite, a new ore of Copper; A. BREITHAUPT, (Poggend. Ann., lxxx, 383.)—Enargite comes from Morococha, district of

Jauli, in the Cordilleras of Peru, at a height of 14,000 feet (French), and also from a mine near Freiberg, along with other copper ores. It occurs in Peru abundantly in large masses containing occasional small druzes of crystals, imbedded with tennantite in crystalline limestone. The Freiberg mine affords it in acicular crystals, which are distinguished from other glances by the prismatic cleavage. Lustre metallic, slightly imperfect; color iron-black; streak black; H. =3 or that of calc spar; G. =4·43–4·445; easily pulverized. Crystallization trimetric; the crystals presenting the planes of a rhombic and rectangular prism; rhombic prism (∞P)=98° 11′: cleavage prismatic, perfect; brachydiagonal and macrodiagonal distinct; basal indistinct; octahedral (P) in traces. Fracture uneven. B.B. in a glass tube, decrepitates and gives with little heat a sublimate of sulphur; in a stronger heat, fuses and produces sulphuret of arsenic of a reddish yellow color; on charcoal it gives out arsenous acid, oxyd of antimony and oxyd of zinc; and in the reduction flame, it finally yields with borax a globule of copper. Analysis of the Peruvian ore afforded Plattner, (ibid, p. 386)—

S	As	Sb	Cu	Fe	Zn	Ag
32·222	17·599	1·613	47·205	0·565	0·228	0·017=99·449

This gives the ratio for the sulphur,—the arsenic and antimony,—and the copper, iron and zinc, 1605 : 197 : 1214, or very nearly 8 : 1 : 6, whence he deduces the formula (writing Cu for copper and the allied metals)—

$$[8\mathrm{Cu\,S}+\mathrm{As\,S}^5]+[2\text{Ɵu}\,\mathrm{S}+\mathrm{As\,S}^5],$$

or perhaps $3(\mathrm{Cu, Fe, Zn})\,\mathrm{S}+(\mathrm{As, Sb})\,\mathrm{S}^5$,

equivalent to sulphur 32·64, arsenic 19·11, copper 48·25.

Carmine Spar; F. SANDBERGER, (Pogg. Ann. lxxx, 391.)—Carmine spar is a red mineral occurring with cube ore (Beudantite) at Horhausen in Saxony, in quartz and brown iron ore.

Crystallization not distinct, probably rhombic; occurs in clusters of fine needles and spheroidal forms of a columnar structure; cleavage parallel to the faces of a rhombic prism. Lustre vitreous, but pearly on a cleavage face; color carmine to tile-red; powder reddish-yellow; translucent; brittle; hardness 2·5, or between rock salt and calc spar. B.B. on charcoal fuses easily to a steel gray globule, giving out arsenical vapors. With soda, yields a globule of lead, and with borax the reaction of iron is obtained. In a glass tube over a spirit lamp, does not change. Heated in concentrated muriatic acid it dissolves very easily to a gold-yellow fluid, in which chlorid of gold does not deposit metallic gold; soluble in nitric acid. From these and other trials, it is inferred that the mineral is an anhydrous arsenate of oxyd of lead and iron; the quantitative relations have not been determined.

Dechenite, a vanadate of Lead; Dr. C. Bergemann, (Pogg. Ann. lxxx, 393.)—Dechenite comes from the Lauter valley in Rhenish Bavaria, near Nieder-Schlettenbach, where the rock is the "bunter sandstein." It occurs in small botryoidal masses, having a crystalline texture, and presenting when purest a dull red color. There appear to be indications of a rhombohedral cleavage. In these masses there are occasional wart-shaped grains of a more yellow color. The streak is always yellowish. Lustre of fresh fracture greasy; G.=5·81; H.=4, or that of green lead ore. B.B. alone in the platinum forceps it fuses easily to a yellowish glass; in a glass tube gives no water; on charcoal, does not decrepitate like the known vanadate ore, but fuses easily to a yellowish green pearl, which yields a slag containing some grains of lead. With more of the assay, the odor of arsenic is sometimes given off. With salt of phosphorus and borax, gives the reaction of vanadic acid. Soda yields a white enamel containing grains of lead.

According to the examinations, the mineral consists of

	$\dot{Pb}$	$\dddot{V}$		
1. Dull red variety,	47·164	52·915	=	100·079
2. " "	46·101	53·717	=	99·818
3. Yellowish "	49·27	50·57	=	99·84

The first two analyses afford the oxygen ratio for the base and acids 1:3, equivalent to the formula $\dot{Pb}\,\dddot{V}$= vanadic acid 45·33, lead 54·67.

Octahedral oxyd of Antimony.—M H. de Senarmont describes (Ann. Ch. Phys. [3], xxxi, 504,) an oxyd of antimony of octahedral forms from Sensa, near the sources of Aïn-el-Bebbouch, (Province of Constantine.) At one locality, the oxyd is in masses often cavernous, composed of capillary filaments parallel or a little divergent, and pearly or adamantine in lustre; it is the prismatic species. But at another mine called *Mimine*, the same oxyd exists in saccharoid masses, granular or compact, having cavities covered with octahedral crystals that are sometimes more than a centimetre in diameter. Several admitted of measurement and proved to be the regular octahedron, the cleavage octahedral, but a little difficult. The composition is that of the pure oxyd, or oxygen 15·68, antimony 84·32. G.=5·22–5·3, while that of the prismatic oxyd is 5·56. Hardness less than that of calcite. Colorless; transparent; strongly refracting without regular action on polarized light. Specific gravity of the massive variety 5·23, and color mostly grayish; contains sometimes less than 1 per cent. of lead, and there may be 1 to 3 per cent. of gray clay. It is probable, from the existence of thermal waters in the soil below, that these crystals were formed in the humid way. Oxyd of antimony is then *dimorphous.* Arsenous acid presents the same forms. Wöhler* observed prismatic crystals which were recognized as like those of oxyd of antimony by Mitscherlich; while octahedral crystals are readily obtained by sublimation or by solution. [*Senarmontite* is an appropriate name for this octahedral oxyd.]

Mineral species described by Prof. C. U. Shepard, (Proc. Amer. Assoc., 4th Meeting at New Haven, p. 311.)—1. *Dysyntribite.* Occurs in considerable masses in St. Lawrence county, New York, and has some resemblance in appearance to serpentine. It is found at Rossie, and at Natural Bridge in Diana, and is usually in connection with the specular iron of the region. It is massive, granular, tough, almost dull, with an even splintery fracture; color dark green, grayish or yellowish, sometimes mottled with red and black. H. = 3·5–4. G. = 2·76–2·81. B.B. in thin fragments fuses to a white porcelainous mass. In an open tube yields water. Contains according to Prof. Shepard—

	$\overline{\text{S}}\text{i}$	$\not{\text{A}}\text{l}$	$\dot{\not{\text{F}}}\text{e}$	$\dot{\text{H}}$	$\dot{\text{C}}\text{a}, \dot{\text{M}}\text{g}$
	47·68	41·50	5·48	4·83	*trace* = 99·49
Oxygen	24·77	19·39	1·21	4·29	

whence he deduces the formula $16\not{\text{A}}\text{l}\,\overline{\text{S}}\text{i}+\dot{\not{\text{F}}}\text{e}^{3}\,\overline{\text{S}}\text{i}^{4}+9\dot{\text{H}}$.

[The dysyntribite is somewhat remarkable for its external resemblance to serpentine, while at the same time it is aluminous in composition. The specimens are very various in appearance, and look much more like a rock than a mineral species, (as might be inferred from the improbable formula given,) appearing to be a result, to some extent, of metamorphic action.]

2. *Rutherfordite*, (ibid, p. 312.)—Occurs in crystals and grains at the gold mines of Rutherford Co., North Carolina, along with rutile, brookite, zircon and monazite. Monoclinic; M : M = 93°. Cleavage, none. Fracture conchoidal; lustre of fracture shining and resinous; color yellowish brown; opake. H. = 6·5; G. = 5·58–5·69. B.B. in a glass tube cracks, glows as if on fire, emits much moisture and turns yellow; alone infusible; with borax forms slowly a clear yellow glass.

According to trials by Prof. Shepard, it is supposed to contain titanic acid, oxyd of cerium and possibly oxyd of uranium and yttria.

3. *Paracolumbite*, (ibid, p. 313.)—Occurs a mile southwest of Taunton, Mass., in minute quantities in a boulder of granite containing a peculiar greenish-white feldspar. Massive, in grains and short irregular seams; iron-black, sometimes with a tinge of purple, and a black streak; imperfectly metallic; opake. H. about 5. From his examinations, Prof. Shepard infers that the mineral seems to be composed of the oxyds of iron and uranium in combination with a metallic acid, which is not the titanic.

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[*] Wöhler on the dimorphism of arsenous acid, Pogg. Ann., xxvi, 177.

4. *Houghite*, (ibid, p. 314.)—Occurs near Oxbow, St. Lawrence Co., N. Y., and also in Rossie, associated with spinel, from which region specimens were received by Prof. Shepard from Dr. Franklin B. Hough of Somerville. It presents oblong flattened reniform concretions, rarely above ¾ths of an inch long, with botryoidal surfaces, whitish externally and bluish or reddish white within; lustre faintly pearly, glimmering. Sometimes has a spinel crystal as a nucleus. H.=2·5. G.=2·02–2·03. It decrepitates and emits water before the blowpipe, losing 33⅓ p. c. by ignition. Appears to be a hydrate of alumina and magnesia.

[Houghite has been studied recently by Mr. S. W. Johnson, of the Yale Analytical Laboratory, who finds that it is a pseudomorph, often of spinel and probably also at times of scapolite; some of his specimens are spinel crystals (octahedral) in one part, and true Houghite in another, and all conditions of change are well illustrated by them. Mr. Johnson is still engaged in his investigations on the subject.]

5. *Marasmolite*, (ibid, p. 315.)—From the feldspar quarry near Middletown, Ct., along with columbite, pitchblende and albite. Monometric, with cubic cleavage; color brownish black, and streak reddish brown; brittle; H.=3·5; G.=3·73–3·74. Composition, according to Prof. Shepard :—

Sulphur 38·65 Zinc 49·19 Iron 12·16

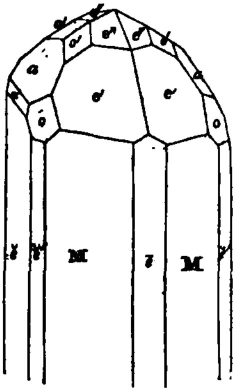
affording the ratio 5 : 3 : 1, and the formula $3\mathrm{Zn\,S} + \mathrm{Fe\,S}^2$. The name is from μαρασμος, *decaying*.—[The marasmolite, according to the writer's examinations of Prof. Shepard's specimen, is a brittle, partially decomposed blende, containing free sulphur in minute points throughout it, as seen with a glass. This free sulphur accounts for the excess in the analysis; allowing thus for a small excess, the composition will become $3\mathrm{Zn\,S}+\mathrm{Fe\,S}$, which is the formula of the marmatite variety of blende.]

6. *Calyptolite*, (ibid, p. 316.)—From Haddam, with chrysoberyl, garnet and beryl; also from the feldspar quarry near Middletown. Crystals minute, and usually square prisms with pyramidal terminations; surfaces not smooth and often somewhat concave; color dark brown; lustre adamantine; opake. H.=6·5. G.=4·34. B.B. in an open tube, yields moisture, having an acid reaction, and becomes pale yellowish white; alone, whitens but does not fuse; does not fuse readily with soda; with borax dissolves slowly into a glass which is yellow while hot, but colorless on cooling. When heated in powder with sulphuric acid for some time, it appears to be completely decomposed, and the glass tube exhibits corrosion. "The quantity of the mineral was too small for a satisfactory examination; but the absence of silica, lime, magnesia and alumina was ascertained; and the probability that the substance is a fluo-columbate of some of the less com-

mon earths and oxyds, established." [We may mention that the most common form closely resembles that of garnet, and the mineral had been referred to this species, which it externally resembles. The angle of the pyramid is given at 122° to 124°; but the surfaces are so irregular that the measurements are uncertain.]

7. *Eumanite*, (ibid, p. 317).—From Chesterfield, Mass., at the albite locality. Only a single minute crystal less than a grain in weight is known. Form trimetric; M : M = 123°. M : e′ = 136°; e′ : e′ = 151° 30′; e′ : e″ = 159° 30′; ĕ : *a* = 127° 40′; M : ĕ = 118°—118° 30′; e′ : *a* = 127° 30′; *a* : *o* = 144° 20′; ĕ : *o* = 128° 20′; e′ : *o* = 156° 30′; surface M rather imperfect and not very lustrous; the other faces brilliant. Color blackish-brown, resembling certain crystals of tin ore. Translucent; color by transmitted light deep red, like almandine garnet. H. above 6.

[The crystal of eumanite has closely the form of topaz, even to the general character and position of the planes on the summit, and is near figure 393 in Dufrenoy's Mineralogy; the angles also are nearly identical. Topaz gives M : M = 124° 19′; and if M on ĕ in eumanite is 118°, it will give 124° for M : M in eumanite—M, M, it should be noted, are the least lustrous faces of the crystal; M : e′ = 135° 59′ (136° in eumanite.) The mineral must therefore be closely isomorphous with topaz, if not identical with it, and some other characters are needed to show that the latter supposition is not true, although so peculiar in its color. In the figure, the edge *o*′ : e″ on the right is parallel to the edge e″ : e″, but not so that on the left; we cannot say which is right.]



Eumanite.

8. *Corundophilite*, (ibid, p. 318).—Occurs with corundum near Asheville in Buncombe county, N. Carolina, in imperfectly stellate groups, and also spreading out in laminæ between layers of corundum. A single crystal, exceedingly minute and less than $\frac{1}{5}$th of a grain in weight, was monoclinic and gave the angles M : M about 120°; P : M = 97° 30′ and 82° 30′; P($0P$) : $\infty P'\infty$ = 88° to 89°; P($0P$) : $mP'\infty$ = 122° 30′. Cleavage basal, perfect; also in traces parallel with M and the shorter diagonal of P. Lustre of cleavage faces commonly pearly. Color dark leek-green, passing into gray and greenish black; streak like the color. Thin laminæ flexible, but less so than talc. B.B. affords a little moisture in a glass tube; alone instantly turns black, and without phosphorescence. Melts at the extremity to a shining black globule; with borax, forms readily with effervescence a clear bottle green

glass. On analysis it afforded Prof. Shepard, Silica 34·75, protoxyd of iron 31·25, alumina 8·55, water 5·47, making a loss of nearly 20 p. c., a portion of which he attributes to the alkalies. 0·146 gramme was used in the analysis. Neither lime nor magnesia were detected. The name is from Corundum and φίλος, *friend.*

[This mineral, as observed by the writer, is usually thin foliated or micaceous. It closely resembles chloritoid in appearance, which, as stated by J. Lawrence Smith, who analyzed a specimen, occurs frequently with the Corundum of Asia Minor; but it divides into much thinner laminæ than is usual in that species and is less brittle. The angles are nearly those of common mica.]

2. *Described Species.*

On some Canadian Minerals, by T. S. Hunt, (Phil. Mag., [4], i, 322.) 1. *Perthite*, of Thomson.—This feldspathic mineral is from Bathurst, and forms part of a eurite rock, being sometimes in large cleavable masses. Form apparently monoclinic. H.=6. G.=2·576–2·579; a darker colored fragment 2·583. Lustre vitreous, inclining to pearly; color a light flesh red, in alternating bands, with reddish or pinchbeck brown, the bands half a line or a line wide, coincident with one of the planes T; the darker bands on the cleavage surface T give a golden reflexion when viewed perpendicularly, like aventurine feldspar. Analysis by Mr. Hunt.

$\dddot{\mathrm{Si}}$	$\bar{\mathrm{A}}\mathrm{l}$	$\bar{\mathrm{F}}\mathrm{e}$	$\dot{\mathrm{Ca}}$	$\dot{\mathrm{Mg}}$	$\dot{\mathrm{K}}$	$\dot{\mathrm{Na}}$		
66·44	18·35	1·00	0·67	0·24	6·37	5·56	ign.	·40=99·03
66·50	19·25		0·56	0·24	6·18	5·56	"	·44=98·73

The composition is that of orthoclase, to which species, as he observes, the mineral had been referred by Shepard, Dana and himself.

2. *Peristerite*, Thomson.—The specimens furnished Mr. Hunt by Dr. Wilson, as duplicates of those sent to Dr. Thomson, were a feldspar containing disseminated quartz grains; and others from the locality were fine cleavable masses often free from the quartz. Form triclinic, near albite in cleavage, being perfect parallel to P and M, less distinct with T, a fine play of colors on P, as in labradorite, a delicate cerulean blue prevailing which occasionally passes into light green and yellow. H.=6. G.=2·625–2·627. Composition according to Mr. Hunt:—

	$\dddot{\mathrm{Si}}$	$\bar{\mathrm{A}}\mathrm{l}$	$\bar{\mathrm{F}}\mathrm{e}$	$\dot{\mathrm{Na}}$	$\dot{\mathrm{K}}$	$\dot{\mathrm{Ca}}$	$\dot{\mathrm{Mg}}$		
I.	66·80	21·80	0·30	7·00	0·58	2·52	0·20	ign.	0·60=99·80
II.	67·25					2·03		"	0·66

whence the mineral is *albite.*

3. *Bytownite.*—The specimen analyzed was from Dr. Holmes and was taken from a specimen pronounced by Dr. Thomson to

be this mineral. H. about 6·5. G.=2·732–2·733. Massive, granular, strongly coherent; grains with one perfect cleavage and indications of another oblique to it. Lustre vitreous, approaching to pearly upon the cleavage faces; translucent; color greenish white. The smoky blue mineral from Perth generally circulated among mineralogists as bytownite, is a mixture apparently of the true bytownite with what appears to be a black hornblende. Composition of the bytownite according to Mr. Hunt,

$\dddot{\mathrm{Si}}$	$\dddot{\bar{\mathrm{A}}}\mathrm{l}$	$\dot{\mathrm{C}}\mathrm{a}$	$\dot{\mathrm{M}}\mathrm{g}$	$\bar{\mathrm{F}}\mathrm{e}$	$\dot{\mathrm{N}}\mathrm{a}$	$\dot{\mathrm{K}}$	$\dot{\bar{\mathrm{H}}}$
47·40	30·45	14·24	0·87	0·80	2·82	0·38	2·00=98·96
47·30							1·80

Mr. Hunt deduces from these results and the characteristics of the species, that it is anorthite. [The oxygen ratio for the protoxyds, peroxyds and silica is 1 : 2·66 : 4·62, which is wide from 1 : 3 : 4, the ratio for anorthite; and therefore, it must be, if this species, an impure variety of it. The mineral thiorsauite of Genth, has nearly the same composition according to Genth's analysis; but this Iceland feldspar is considered impure anorthite by Rammelsberg.]

4. *Labradorite.*—Common in boulders from Labrador to Canada West, but has not been observed in place. A specimen from Drummond, C. W., of a lavender blue color and pearl-gray opalescence, had the sp. gr. 2·697, and consisted as follows:—

$\dddot{\mathrm{Si}}$	$\dddot{\bar{\mathrm{A}}}\mathrm{l}$	$\dot{\mathrm{C}}\mathrm{a}$	$\bar{\mathrm{F}}\mathrm{e}$	$\dot{\mathrm{M}}\mathrm{g}$	$\dot{\mathrm{N}}\mathrm{a}$	$\dot{\mathrm{K}}$	$\dot{\bar{\mathrm{H}}}$
54·70	29·80	11·42	0·36	*trace*	2·44	0·33	0·40=99·35

Mr. Hunt observes with regard to the water in this and other feldspars, that he agrees with Delesse and Laurent, in considering it as belonging to the constitution of the mineral and not hygroscopic.

5. ***Raphilite*** of Thomson.—This mineral from Lanarck, C. W., is tremolite. H.=5·5. G. (in powder) =2·845. Lustre vitreous silky; color grayish or greenish-white, becoming reddish on weathered surfaces. Composition:—

	$\dddot{\mathrm{Si}}$	$\dddot{\bar{\mathrm{A}}}\mathrm{l}$	$\dot{\mathrm{C}}\mathrm{a}$	$\dot{\mathrm{M}}\mathrm{g}$	$\dot{\mathrm{F}}\mathrm{e}$	$\dot{\mathrm{M}}\mathrm{n}$	$\dot{\mathrm{N}}\mathrm{a}$	$\dot{\mathrm{K}}$	
	55·30	0·40	13·36	22·50	6·30	*traces*	0·80	0·25	ign. 0·30=99·31
Oxygen	28·72	0·19	3·80	8·72	1·40		0·21	0·04	

6. ***Retinalite and Serpentine.***—The retinalite of Thomson was founded on a serpentine from near Grenville, sent him by Dr. Holmes, and a portion of the same specimen he gave Mr. Hunt for analysis; other specimens were procured at the locality. It fills seams or penetrates granular limestone near a trap dyke. H.=3·5. G.=2·494–2·525–2·476. Lustre resinous; streak white; color honey yellow passing into oil green and olive green; translucent; fracture conchoidal. Composition:—

	$\dddot{\mathrm{Si}}$	$\bar{\mathrm{F}}\mathrm{e}$	$\dot{\mathrm{M}}\mathrm{g}$	$\dot{\mathrm{N}}\mathrm{a}$	$\dot{\bar{\mathrm{H}}}$
I.	39·34	1·80	43·02	*trace*	15·09 = 99·25
II.	40·10	1·90	41·65	0·90	15·00 = 99·55

Another serpentine of similar character, from Grand Calumet Island, having a pale wax color and sp. gr. 2·362–2·381, afforded—

$\dddot{\mathrm{Si}}$	$\dot{\bar{\mathrm{F}}}\mathrm{e}$	$\dot{\mathrm{Mg}}$	$\dot{\bar{\mathrm{H}}}$
41·20	0·80	43·52	15·40 = 100·92

Mr. Hunt observes that the mineral has the composition of marmolite of Hermann, but is not foliated; and he inclines to consider the species as not distinct from serpentine.

7. *Zircon.*—Crystals half an inch thick and an inch or more long occur at Grenville, along with tabular spar, calc spar, sphene, pyroxene and plumbago. G. = 4·602–4·625. Color brownish red, passing into flesh-red and cherry-red. Analysis afforded Mr. Hunt:

Silica 33·7 Zirconia 67·3 = 101·0

The zirconia contained a trace of iron which was not separated.

Celestine.—The crystallization of celestine has been studied with much labor by M. Hugard, and some new crystalline forms are described by him (Ann. des Mines, [4], xviii, 3.) Mr. Hugard adopts as the mean of his measurements, for M : M, 104°, the angle varying between 103° 30′ and 104° 30′; he observes that the crystals which vary most from this are chemically impure. A neat crystal from Lake Erie gave him constantly less than 104° (mean, 103° 30′); but the Lake Erie celestine contains a considerable proportion of sulphate of barytes. The paper is illustrated by twenty-seven figures.

Limestone of Predazzo.—This mineral, called Predazzite by Petzholdt, is a carbonate of lime and magnesia containing water. This chemist deduced the formula $2\dot{\mathrm{Ca}}\ddot{\mathrm{C}}+\dot{\mathrm{Mg}}\ddot{\mathrm{C}}\dot{\bar{\mathrm{H}}}$. J. Roth, by his analysis (J. f. pr. Chem. lii, 346,) makes the composition of a white variety, $2\dot{\mathrm{Ca}}\ddot{\mathrm{C}}+\dot{\mathrm{Mg}}\dot{\bar{\mathrm{H}}}$ = carbonic acid 34·11, lime 43·41, magnesia 15·50, water 6·98 = 100. He obtained—

	$\ddot{\mathrm{C}}$	$\dot{\mathrm{Ca}}$	$\dot{\mathrm{Mg}}$	$\dot{\bar{\mathrm{H}}}$			
I.	33·35	44·67	14·54	6·96	$\dddot{\mathrm{Si}}$, $\dddot{\bar{\mathrm{A}}}\mathrm{l}$, $\dddot{\bar{\mathrm{F}}}\mathrm{e}$ 0·48	= 100·00;	G = 1·868
II.	33·98	42·63	14·05	7·00	$\dddot{\mathrm{Si}}$ 0·29 $\dddot{\bar{\mathrm{A}}}\mathrm{l}$, $\dddot{\bar{\mathrm{F}}}\mathrm{e}$ 0·49	= 98·44;	G = 1·018

For another variety of a gray color he obtained, excluding the alumina, silica and oxyd of iron, which amount to 6 per cent.—

	$\ddot{\mathrm{C}}$	$\dot{\mathrm{Ca}}$	$\dot{\mathrm{Mg}}$	$\dot{\bar{\mathrm{H}}}$
I.	29·23	35·70	24·78	10·92 = 100·63; G = 1·005
II.	28·10	35·97	24·47	10·97 = 97·51; G = 0·621

Whence he has the formula $\dot{\mathrm{Ca}}\ddot{\mathrm{C}}+\dot{\mathrm{Mg}}\dot{\bar{\mathrm{H}}}$ = carbonic acid, 27·85, lime 35·44, magnesia 25·32, water 11·39 = 100. Brucite occurs in the marble of Predazzo, and also a variety of serpentine.

Composition of Apatite from Snarum; G. Rose (Monatsb. Akad. zu Berlin, March, 1851, 173.)—Analyses by M. Weber in the laboratory of H. Rose:—

	$\dot{\mathrm{Ca}}$	$\dot{\mathrm{F}}\mathrm{e}$, $\dot{\mathrm{C}}\mathrm{e}$, $\dot{\mathrm{Y}}$	$\bar{\mathrm{P}}$	Cl
I.	53·16	1·76	41·82	2·66
II.	53·79	1·74	41·47	"
III.	53·44	1·86	41·33	"
Mean,	53·46	1·79	41·54	2·66

Calculating the lime phosphate from the amount of phosphoric acid, the chlorid of calcium from the chlorine, and the fluorid from the remaining lime, G. Rose deduces for the composition—

$\dot{Ca}^3\ddot{P}$	$Ca\,Cl$	$Ca\,F$	$\bar{F}e\,\bar{C}e\,\dot{Y}$
90·66	4·17	3·07	1·79

In the analysis formerly made by G. Rose, this chemist found in the Snarum apatite, lime 54·75 and chlorine 2·713, whence he deduced—

$\dot{Ca}^3\ddot{P}$	$Ca\,Cl$	$Ca\,Fl$
91·13	4·28	4·59

agreeing very nearly with the analysis by Weber. Weber's results with the new modes of determination of phosphoric acid therefore confirm the earlier deductions of Rose.

Diaspore.—Occurs according to Prof. C. U. Shepard, (loc. cit. p. 319,) at the fluor spar and topaz vein at Trumbull, Conn., in thin or 6-sided tables, flattened parallel to the shorter diagonal. It is the species formerly announced by Prof. Shepard as euclase. $M : M = 130° 30'$, $M : o = 125°$; $o : o = 152° 30'$; o : on $\infty\breve{P}\infty = 104° 30'$. H.=7–7·5. G.=3·29. Analysis afforded Prof. Shepard, Alumina 84·9, water 15·1=100.

Hydrargillite from Brazil.—Von Kobell announces this mineral (J. f. pr. Chem. l, 493, 1850,) as occurring in Brazil, and as having been mistaken for wavellite. It occurs in spheroidal concretions, having a radiato-lamellar structure, giving some indications of rectangular prisms. Color grayish to yellowish-white; translucent; lustre pearly inclining to vitreous; hardness between calc spar and fluor spar. Dissolves wholly in concentrated sulphuric acid. Composition according to von Kobell:—alumina with a trace of silica 67·26, water 32·39=99·65, and giving the formula $\bar{A}l\,\dot{H}^3$. It was found to contain no phosphoric acid.

New form of Compound Crystal of Quartz.—M. G. Rose has described a compound crystal of quartz (Monatsb. Akad. zu Berlin, March, 1851, p. 171), which consisted of four crystals, one a central, and each of the others united to the first correspondingly by a primary rhombohedral face, the axes of the central and the others, making an angle equal to the complement of double the angle between a rhombohedral plane in the primary and its vertical axis; the latter angle is 38° 13′ according to Kupffer, whence the inclination of the axes is 103° 34′. The primary faces of the pyramid are larger than those alternate, and the prism has its alternate planes larger so as to approach a 3-sided form. The specimen is from the serpentine of Reichenstein, and is associated with small crystals of arsenical iron.

Serpentine.—G. Rose has examined crystals of serpentine in the collections of Berlin (Monatsb. Berl. Akad.,) and sustains the view that they are pseudomorphs of olivine. There are three crystals which have an interior of olivine. A portion of a crystal from Snarum, received from Quenstedt, afforded Hefter in his laboratory,—

	$\dddot{\text{Si}}$	$\dot{\text{Mg}}$	$\dot{\text{Fe}}$	$\dot{\text{Mn}}$	$\dot{\bar{\text{H}}}$	
	41·93	53·18	2·02	0·25	4·00	= 101·38 – ; G = 3·0384
Oxygen	21·79	20·58	0·46	0·06	3·58	

Showing that it is a mixture of olivine and serpentine. The crystals of Snarum and of the Fassa valley in the Tyrol are therefore pseudomorphs. The villarsite of Dufrénoy, which is similar in its crystalline forms, he refers to the same origin. He regards serpentine as an amorphous material incapable of crystallization. Substances perhaps occur imperfectly crystallized, having the same composition; but the only substance of this nature, which he recognizes, is chrysotile. Schiller spar, which is allied in composition, the author regards as no natural mineral in crystallization, but a pseudomorph after augite, with which it is often associated. He alludes to the frequent occurrence of serpentine pseudomorphs imitative of many of the mineral species, as hornblende, augite, garnet, chondrodite, spinel, mica, &c.

Serpentine of the Vosges.—The serpentine of the Vosges and its associated minerals, have been investigated chemically and otherwise by M. Delesse (Ann. d. Mines, [4], xviii, 309), whose descriptions are very full and complete. The minerals noticed are garnet, chromic and magnetic iron, iron pyrites, diallage, chlorite, chrysotile, calcite, dolomite, nemalite, brucite, feldspar, quartz, talc, asbestus, and specular iron.

Garnet occurs of red, brownish and greenish or grayish-green colors. B.B. it fuses with difficulty, and in a tube yields some water. H. = 6·5. G. = 3·150. Composition:—

$\dddot{\text{Si}}$	$\dddot{\bar{\text{Al}}}$	$\dddot{\bar{\text{Cr}}}$	$\dddot{\bar{\text{Fe}}}$	$\dddot{\bar{\text{Mn}}}$	$\dot{\text{Mg}}$	$\dot{\text{Ca}}$	
41·56	19·84	0·35	10·17	*trace*	22	4·25,	ign. 1·58 = 99·75

Diallage is sometimes disseminated through the serpentine, but occurs commonly in small masses or in the intersecting veins. Color deep olive-green, and occasionally, emerald green. The latter variety is sometimes found within a nodule of garnet. Lustre a little pearly but not like bronze. G = 3·154. Analysis gave—

$\dddot{\text{Si}}$	$\dddot{\bar{\text{Cr}}}$, $\dddot{\bar{\text{Mn}}}$	$\dot{\text{Fe}}$	$\dot{\text{Mg}}$ (by diff.)	$\dot{\text{Ca}}$	
56·33	1·50	6·73	31·93	1·40,	ign. 2·11 = 100

The 2·11 p. c. given off by heating are nearly all water. Formula $\dot{\text{R}}^3\dddot{\text{Si}}$.

Chlorite occurs in veins or in nodules of garnet, and evidently the garnet has been altered to chlorite, as the different stages of the process may be detected. B.B. becomes grayish and takes a metallic lustre, and if in lamellæ the edges are rounded, forming a grayish green glass. With salt of phosphorus gives evidence of chrome, and with soda, a manganese reaction. Composition of the chlorite of the Col de Pertuis—

$\dddot{\mathrm{Si}}$	$\dddot{\bar{\mathrm{Al}}}$	$\dddot{\bar{\mathrm{Cr}}}$	$\dddot{\bar{\mathrm{Fe}}}$	$\dot{\mathrm{Mn}}$	$\dot{\mathrm{Mg}}$ (by diff.)	$\dot{\mathrm{Ca}}$
33·23	14·78	1·49	6·28	1·39	30·76	1·86, ign. 10·21 = 100

Bischof has shown that a solution of bicarbonate of magnesia will transform, even when cold, silicate of lime recently prepared into carbonate of lime and silicate of magnesia; and with this fact, M. Delesse observes that the change of garnet into chlorite may be explained. The pseudomorphosis has taken place over a wide extent.

Chrysotile occurs in seams having a delicate fibrous texture; it is translucent, and the fibres separated are transparent; color oil-green, usually clear, sometimes olive-green; lustre silky. G. = 2·223. B.B. yields water; on platinum wire, it gives a bright light and fuses with difficulty to a glass slightly brownish. Dissolves with borax or soda. Composition:—

$\dddot{\mathrm{Si}}$	$\dddot{\bar{\mathrm{Al}}}$	$\dot{\mathrm{Fe}}$	$\dot{\mathrm{Mg}}$ (by diff.)	$\dot{\mathrm{H}}$
41·58	0·42	1·69	42·61	13·70 = 100

The picrolite of Stromeyer has the same composition.

Nemalite occurs at Xettes in the Vosges, and also at Saint Sabine. *Brucite* is found at Goujot.

The *Serpentine* is of various qualities and colors. Analyses:

	$\dddot{\mathrm{Si}}$	$\dddot{\bar{\mathrm{Al}}}$	$\dddot{\bar{\mathrm{Cr}}}$	$\dot{\mathrm{Fe}}$	$\dot{\mathrm{Mn}}$	$\dot{\mathrm{Ca}}$	$\dot{\mathrm{Mg}}$ (by diff.)	ign.
1. Blackish-green, Liésey,	40·83	0·92	0·68	7·39	*trace*	1·50	37·98	10·70 = 100
2. Maroon-red, Goujot,	42·26	1·51	——	7·11	——	0·80	38·90	9·42 = 100

Specific gravity of the first 2·749.

In the second analysis, the alumina as obtained included some chrome and oxyd of manganese. The serpentine of Goujot takes a fine polish and sells at 54 francs the square meter.

The author next discusses the relative age and the origin of the minerals and serpentine, giving many views of interest. He observes that of the minerals which have been formed in serpentine, those most magnetic (as those rich in iron) have remained in the paste, while those that are diamagnetic have been separated into fissures, so as to form veins or amygdaloids. The magnetic and diamagnetic forces, according to this view, have acted an important part in the development and distribution of the included minerals.

Picrolite of Silesia.—Analysis by Dr. List, (Ann. d. Ch. u. Pharm., lxxiv, 241):—

$\dddot{\mathrm{Si}}$	$\dot{\mathrm{Mg}}$	$\dot{\mathrm{Fe}}$	$\dot{\mathrm{H}}$
44·606	39·748	2·631	2·576 = 99·561

Leuchtenbergite.—Breithaupt (Pogg. Ann., lxxx, 577) observes that the specimens of Leuchtenbergite are evidently more or less altered by exposure or otherwise, and this is farther proved by the fact that Komonen obtained but 8·62 per cent. of water, and Hermann 12·5 per cent. He therefore suggests that quite probably the mineral may exist in the unaltered state and prove to be a distinct species.

Delessite of Naumann, is a ferruginous chlorite from amygdaloid.

Ozarkite.—On an examination of this mineral, Prof. Shepard obtained the following result (Proc. Assoc., loc. cit., p. 322.)—$\dddot{Si}$ 40·91, $\dddot{\bar{Al}}$ 15·75, phos. lime 4·17, lime 4·52, water 15·10, and observes that this removes the mineral from Scolecite, to which it is referred by Mr. J. D. Whitney. [The investigations of the species by Messrs. Brush, Whitney and Shepard, the latter in two different trials, are so widely different, that we have not reason to believe that in any case a *simple* mineral has been examined.]

Soda-mesotype of the Zircon-syenite of Laurvig.—Analysis by C. G. Gmelin (Pogg. Ann., lxxxi, 311):—

$\dddot{Si}$	$\dddot{\bar{Al}}$	$\dot{Na}$	$\dot{K}$	$\dot{H}$
48·680	26·869	16·002	20·362	9·550 = 100·958 ; G. = 2·207

Hence the formula $\dot{Na}\dddot{Si}+\dddot{\bar{Al}}\dddot{Si}+2\dot{H}$. It gelatinizes with muriatic acid, before and after heating. The feldspar of the rock contains much soda.

Hydrosilicates of Alumina.—The following are analyses by M. Salvetat:—I. of Halloysite from Saint Jean de Colle, near Thiviers (Dordogne,)—II. Halloysite of unknown locality,—III. of Smectite from Condé, near Houdan (Seine-et-Oise,)—IV. Lenzinite from La Vilate, near Chanteloube, (Ann. Ch. Phys. [3], xxxi, 102.)

	$\dddot{Si}$	$\dddot{Si}$ gel.	$\dddot{\bar{Al}}$	$\dddot{\bar{Fe}}$	$\dot{Ca}$	$\dot{Mg}$	$\dot{K}$	$\dot{Na}$	$\dot{H}$
I. *H.* from St. J. de C.	45·55	1·04	22·60	1·05	1·66	0·30	0·04	0·06	26·20, q'tz 1·04 = 99·46
Oxygen	23·60		10·55	0·32	0·46	0·12	0·01	0·01	23·28
II. *H.*, loc.?	45·44	—	24·00	1·35	0·83	0·09	0·98		26·70 = 99·35
Oxygen	23·60		11·21	0·41					23·93
III. *Smectite*	43·00	1·50	32·50	$\dot{Fe}$ 1·20	1·02	0·30	0·40		21·70 = 101·62
Oxygen	22·34		15·18						19·08
IV. *Lenzinite*	36·36	0·20	36·00	$\dddot{\bar{Fe}}$ 1·95	—	0·18	0·50		21·50, q'tz 1·64 – 100·13
Oxygen	18·89		16·82	0·61					19·02

Formulas, omitting the protoxyds which are probably impurities,

I. and II. $\dddot{\bar{R}}\dddot{Si}^2+7\dot{H}$ III. $\dddot{\bar{Al}}^2\dddot{Si}^3+7\frac{1}{2}\dot{H}$ IV. $\dddot{\bar{Al}}\dddot{Si}+8\dot{H}$.

The Halloysite from near Thiviers is tender, soapy and mild to the touch, of paler rose color than that of Montmorillon. B.B. infusible, and at a red heat loses color. Does not form a paste with water. In contact with water it divides into small fragments, and gives out bubbles of air with an argillaceous odor. Boiling sulphuric acid attacks the mineral. The second Halloysite has similar characters. On account of the difficulty of distinguishing between hygroscopic water and that of combination, the author acknowledges that some doubt exists with regard to this term in the formula. Dried at 100° C. in a moist air, the $7\dot{\bar{H}}$ (obtained after drying at 16° C.) are reduced to $4\dot{\bar{H}}$; and at 100° C. in a dry air, to $3\dot{\bar{H}}$.

The Smectite is greenish, not homogeneous in appearance, and affords a magma of two substances, one colorless and the other slightly greenish, but both of the same composition; and the mass encloses here and there crystals of gypsum. In a certain state of humidity it appears transparent and almost gelatinous. It adheres strongly to the tongue. Moistened with water it yields an argillaceous odor and acts like Halloysite, except that it makes a plastic paste. It contains $7\frac{1}{2}\dot{\bar{H}}$, when dried at 16° C., 5½, if dried at 100° in a moist atmosphere, and 4½ at 100° in a dry atmosphere.

The Lenzinite occurs in pegmatite (whence it is explored for pottery) in small thin beds, having a brownish color, soft enough to be impressed with the fingers, but not plastic. On drying, the color slightly changes. B.B. infusible. Partly dissolved in hot sulphuric acid, leaving a white insoluble residue. At 100° C., the mineral contains $2\frac{1}{2}\dot{\bar{H}}$.

Atheriastite.—J. F. L. Hausmann shows (Pogg. Ann., lxxxi, 567,) that this mineral which was formerly referred to Scapolite, but recently instituted as a species by Weibye, is an altered scapolite, as is suggested by the writer in this Journal, vol. x, p. 246.

Feldspar of Laurvig and Friederichsvärn.—Analysis by C. G. Gmelin, (Pogg. Ann., lxxxi, 313,)—

	$\dddot{\mathrm{Si}}$	$\overline{\dddot{\mathrm{Al}}}$	$\dot{\mathrm{K}}$	$\dot{\mathrm{Na}}$	$\dot{\mathrm{Ca}}$	$\overline{\dddot{\mathrm{Fe}}}$	
1. Laurvig,	65·90	19·46	6 55	6·14	0·28	0·44,	ign. 0·12= 98·89; G.=2·5872
2. Friederichsvärn,	65·19	19·99	7·03	7·08	0·48	0·63,	“ 0·38=100·78; G.=2·590

The first is of a pale greenish gray color, the second sky-blue.

Epidote.—The objections which Rammelsberg brought against the investigations of Hermann on the constitution of Epidote, are replied to by Hermann in the Jour. f. pr. Chem., vol. liv, p. 250. Hermann had in a former memoir presented the conclusion that the species included several distinct chemical compounds. Rammelsberg, in reply, after a new determination of the proportion of protoxyd and peroxyd of iron, referred all the varieties which he examined under a single formula, and suggested that the others would conform to it. Hermann in his recent memoir offers reasons in favor of his former deductions.

Gadolinite, (Phil. Mag. [4], i, 350.)—Occurs in Ireland near Galway in a trap rock containing also epidote.

New American localities, reported by Prof. C. U. Shepard.—(loc. cit., p. 320.) 1. *Ores of Uranium at Middletown, Ct.* Pitchblende occurs at the feldspar or "china-stone" quarry in small crystals which are octahedrons with truncated edges and angles. It is associated with uranochre and also traces of carbonate of uranium and the sulphate (Johannite).

2. *Ores of Bismuth at Haddam, Ct.*—Bismuthine was noticed by Prof. Shepard some time since as occurring sparingly at the Chrysoberyl locality of Haddam. Bismutite and Bismuth ochre are now reported by him (loc. cit., p. 320) as occurring at the same place, the former in thin coatings upon crystals of Bismuthine and the latter in a pulverulent form and usually yellow.

3. *Samarskite in Rutherford Co., N. C.*—In angular grains, some weighing a quarter of an ounce, from the washings of one or more gold mines. The form appears from some of the fragments to be near that of Columbite. Color velvet black; streak dark reddish-brown. Opake; H.$=5{\cdot}5$; G.$=5{\cdot}69$. When first heated in a glass tube, it decrepitates, flies to pieces, glows slightly after the manner of Gadolinite, but remains of a black color. [No analysis or chemical examination is given.]

4. *Thorite at Danbury, Ct.*—This mineral is from Danbury, where it occurs with the Danburite, sphene and augite. It is stated to be either thorite or a new species. It occurs in minute square prisms ($\frac{1}{20}$th inch long) with truncated edges and having a pyramid at summit. The lower part of the four pyramidal planes forms a separate set of planes inclined at an angle of 160° to the terminal set; but in the specimen, only one out of the four of the lower set is present and this is not very distinct. Angle of the terminal set (*P*), over summit, 98°; same on M ($\propto P \infty$) 120°. Cleavage imperfect. Lustre resinous; color black. H.$=5-6$. Heated in an open tube yields much moisture having an alkaline reaction. B.B. becomes brownish-red but does not fuse, but when most heated has finally a semi-fused aspect. With borax gives a glass colored by iron. [The characters given are insufficient to prove that the mineral is Thorite, as Prof. Shepard observes. The angle 98° is near the same in rutile, zircon, xenotime; calculating from this angle, the angle given as 120° would be 117° 40′. If 120° is right, 98° should be 90°, and the form might be cubic.]

Chromic iron of Baltimore.—Analysis by **A. Rivot**, (Ann. Ch. Phys., Oct., 1850, [3] xxx, 202.)

$\overline{\text{Fe}}$	$\overline{\text{Al}}$	$\overline{\text{Cr}}$	$\dot{\text{Ca}}$	$\dddot{\text{Si}}$, $\ddot{\text{Ti}}$	
30·04	1·96	63·37	2·02	2·21	$=99{\cdot}60$

The oxygen of the peroxyd of iron and alumina is together nearly half of that of the oxyd of chrome.

Misy from Rammelsberg near Goslar.—Dr. List describes this iron sulphate as follows. (Ann. Chem. u. Pharm., lxxiv, 239.) It occurs as an aggregate of small crystalline scales having a pearly lustre approaching vitreous, a dull sulphur-yellow color. These scales, under a lens, are seen to be rhombic tables with the acute lateral edge truncated. It does not properly dissolve in pure water, but after a while is decomposed, the fluid becoming brownish red and having an acid reaction; in water with a little sulphuric acid it is not decomposed. Analysis gave,—

$\bar{S}$	$\overline{Fe}$	$\dot{Zn}$	$\dot{Mg}$	$\dot{K}$	$\dot{H}$
42·922	30·066	2·491	2·812	0·318	21·391=100.

In another trial Dr. List obtained 43·208 $\bar{S}$ and 30·365 $\overline{Fe}$. The zinc, magnesia and potash are attributable to mixture with some sulphate of zinc, of magnesia, and of potash present as impurity. Excluding these, the result becomes—

	$\bar{S}$	$\overline{Fe}$	$\dot{H}$
	47·075	40·622	12·313
Oxygen	28·203	12·170	10·947

whence the ratio, nearly, 2·5 : 1 : 1, and the formula $\overline{Fe}^2\bar{S}^5+6\dot{H}$, which is that of Copiapite (H. Rose) excepting the water which is $18\dot{H}$ in that species.

Manganese Ores of the Pyrenees.—For a paper on the position and origin of these ores by M. Gruner, see Ann. des Mines, [4,] xviii, 61. The author also discusses the origin of associated minerals and ores.

Glaucodot.—This mineral according to Breithaupt, (Pogg. Ann., lxxxi, 578,) occurs at Orawitza in the Bannat along with a pale yellow calc spar. It is thin columnar. M. Patera obtained, Sulphur 19·78, arsenic 43·63, cobalt 32·02, iron 4·56.

Copper Nickel of Ayer.—Analysis by Ebelmen, (Ann. des Mines, [4,] xi, 55.)

As	Sb	S	Ni	Co	Fe		
54·05	0·05	2·18	43·50	0·30	0·45	Gangue	0·20 = 100·75

White Blende of New Jersey, (Phil. Mag. [4], i, 23.)—The colorless Blende from Franklin, New Jersey, called "Cleiophane" by Mr. Nuttall, has been analyzed by T. H. Henry, with the following result:—Zinc 67·46, sulphur 32·22=99·68, corresponding to a very pure blende. Sp. gr. at 60°, 4·063. A trace of cadmium was found by means of Wollaston's test.

Troostite of New Jersey, (Proc. Amer. Assoc. at New Haven, 4th meeting, p. 146.)—An analysis of Troostite by Henry Wurtz, afforded

$\bar{Si}$	$\dot{Zn}$	$\dot{Mn}$	$\dot{Fe}$	$\dot{Mg}$	$\dot{Ca}$
27·91	59·93	3·73	5·35	1·66	1·60 = 100·18,

giving the oxygen ratio for the protoxyds and silica 14·96 : 14·50, or very closely the formula $\dot{Zn}^3\,\bar{Si}$.

Calamine and Electric Calamine.—A paper on the analysis of these ores by Emil Schmidt is to be found in the Jour. f. pr. Chem., li, 257.

Wulfenite or Molybdate of lead from the mine Azulaques, near Blanca in Zacatecas.—Analysis afforded Dr. C. Bergemann, (Pogg. Ann., lxxx, 400,) $\dddot{\text{Mo}}$ 37·65, $\dot{\text{Pb}}$ 62·35 = 100·00. The crystals are of a light yellow color.

Mimetene of the Mine Azulaques in Zacatecas.—Dr. C. Bergemann obtained in an analysis (Pogg., lxxx, 401,)

$\dot{\text{Pb}}$	$\ddot{\bar{\text{As}}}$	Cl
74·961	23·065	2·445 = 100·471,

giving the formula $\text{Pb Cl} + 3\dot{\text{Pb}}^3 \ddot{\bar{\text{As}}}$. This corresponds to Arsenic acid 23·065, oxyd of lead 66·948, chlorine 2·445, lead 7·140.

Gray Copper from the foot of the ridge Mouzaïa in Algiers.—Analysis by Ebelmen (Ann. des Mines, [4,] xi, 47):—

S	Sb	As	Cu	Fe	Zn
27·25	14·77	9·12	41·57	4·66	2·24 = 99·61.

Specific gravity 4·749; occurs in highly modified dodecahedral crystals.

Dioptase.—Dioptase (Smaragdo-chalcite) is announced by F. Sandberger (Pogg. Ann., lxxxii, 133,) as occurring in a sandstone containing Spirifers in the Duchy of Nassau, betwen Oberlahnstein and Braubach.

Sulphate and carbonate of Copper at Bristol, Ct.; Prof. C. U. Shepard, (Proc. Amer. Assoc., New Haven, p. 322.)—A dull verdigris green mineral containing carbonic acid occurs upon the vitreous copper ore of Bristol. Prof. Shepard observes that if when more fully examined it proves to be a definite chemical compound, as he now suspects, it will then be proper to bestow upon it a mineralogical name. J. D. D.

(*To be continued.*)

Art. XXV.—*Notice of the Report on the Geology and Topography of a portion of the Lake Superior Land District;*[*] by J. W. Foster and J. D. Whitney.

The district embraced within the Report of Messrs. Foster and Whitney covers an area of 16,000 square miles, and nearly the whole of it is still an unbroken wilderness. The opening of the Michigan Copper mines has given it a peculiar economical interest, and, more than this, it has a high geological importance, hardly exceeded elsewhere, on account of the singular character of the mineral region, the structure and relations of the rocks in different parts, and the display of the phenomena of drift. The investigations in the same region, made by Dr. C. T. Jackson,

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[*] Report on the Geology and Topography of a portion of the Lake Superior Land District, in the State of Michigan; by J. W. Foster and J. D. Whitney, United States Geologists. In two parts. Part 1, Copper Lands. 244 pp. 8vo, with 12 plates and several maps. Washington, 1850. 31st Congress, 1st Session. Ex. Doc. No. 69.