ART. XIX.—*Tenth Supplement to Dana's Mineralogy;* by GEO. J. BRUSH, Professor of Metallurgy in Yale College.

List of Works, etc.

A. KENNGOTT: Uebersicht der Resultate mineralogischer Forschungen im Jahre 1860. 8vo, pp. 217. Leipzig, 1862.

H. KOPP UND H. WILL: Jahresbericht über die Fortschritte der Chemie, und verwandter Theile anderer Wissenschaften. 8vo, pp. 906. Giessen, 1861.

H. GIRARD: Handbuch der Mineralogie. 8vo, pp. 656. Leipzig, 1862.

F. v. KOBELL: Die Mineralogie—Populäre Vorträge. Frankfurt a. M. 1862.

H. O. LENZ: Mineralogie der alten Griechen und Römer. 8vo, pp. 194. Gotha, 1861.

FRIEDERICH HESSENBERG: Mineralogische Notizen, No. 4. Dritte Fortsetzung. 4to, 44 pp. Frankfurt, 1861. This number of Hessenberg's "Notizen" contains figures and descriptions of crystals of Gypsum from Girgenti; Calcite from Bleiberg, Maderaner-Thal and Ahrnthal; Apatite, Sphene and Perowskite from Pfitsch in Tyrol; American Chrysoberyl; Datholite from Bergen Hill; Haytorite; Fahlerz from Kahl; Barytes from Ober Ostern; Brucite from Texas, Pennsylvania; Orthoclase from Baveno.

A. SCHRAUF: Monographie des Columbit. 8vo, pp. 20, mit 7 Tafeln. Wien, 1861.

H. DAUBER: Ermittelung Krystallographischer Constanten, und des Grades ihrer Zuverlässigkeit (22. Rothbleierz). 8vo, pp. 53, mit 12 Tafeln. Wien, 1860.

PETERS K. F.: Mineralogische Notizen. I, Ein Beitrag zur Entwicklungs-Geschichte des Azurits und des Malachites von Moldava im Banat. II, Ueber Kalcit und die rhomboedrischen Karbonspathe im Allgemeinen. III, Miscellaneen—Neues Jahrbuch für Mineralogie, etc., Jahrgang, 1861, pp. 278–285, 434–458, 655–666.

——— Geologische und Mineralogische Studien aus dem südöstlichen Ungarn, insbesondere aus der Umgegend von Retzbanya. Sitzungsberichte der Wien. Akad. der Wissenschaften, xliii, 385–463, xliv, 81–187.

H. SAINTE CLAIRE DEVILLE: De la présence du Vanadium dans un minerai alumineux du midi de la France. Etudes analytiques sur les matières alumineuses. ANN. de Chimie et de Physique, (3,) lxi, 309.

* Pogg. Annalen, vol. cxiv, p. 167.

H. SAINTE CLAIRE DEVILLE: Observations sur la présence de quelques éléments ordinairement tèrsrares dans des substances plus communes. Ann. de Chimie et de Physique, (3), lxi, 342.

——— Du mode de formation de la Topaze et du Zircon. Compt. Rendus, lii, 780.

——— De la production de la Willémite et de quelques Silicates métalliques. Comptes Rendus, lii, 1304.

——— Reproduction de Fer oxydulé, de la Martite, et de la Périclase—Protoxyde de Manganése cristallisé. Comptes Rendus, liii, 199.

H. ST. CLAIRE DEVILLE ET TROOST: De la reproduction des Sulfures métalliques de la nature. Comptes Rendus, lii, 920.

A. DAUBRÉE: Observations sur les Zéolithes formées dans un béton romain par les Eaux thermales de Luxeuil (Haute-Saône). Bull. Soc. Geol., xviii, 108.

—— Betrachtungen und Versuche über den Metamorphismus und über die Bildung der krystallinischen Gesteine. Aus dem xvii. Bande der Mémoires présenté par divers savants a l'Académie des Sciences. Paris, 1860, übersetzt von E. SÖCHTING, Berlin, 1861.

A. DES CLOIZEAUX: Memoire sur un nouveau Procédé propre à mesurer l'Indice moyen et l'Ecartement des Axes optiques dans certaines substances où cet écartement est très-grand, et sur la Séparation de plusieurs Espèces minérales regardées jus'qu' ici comme isomorphes. Comptes Rendus, lii, 784.

——— Sur les Modifications temporaires et sur une Modification permanente que l'Action de la Chaleur apporte à quelques propriétés optiques du Feldspath orthose. Comptes Rendus, liii, 64.

——— Notice sur les Travaux minéralogiques et géologiques. 4to, pp. 37. Paris, 1861.

A. DELESSE: De l'Azote et des Matières organiques dans l'Ecorce terrestre. 8vo, pp. 176. Paris, 1861.

——— Etudes sur le Métamorphisme des Roches. 4to, pp. 95. Paris, 1861.

E. HITCHCOCK, E. HITCHCOCK, Jr., C. H. HITCHCOCK AND A. D. HAGER: Geology of Vermont. 4to, pp. 988. Claremont, 1861.

J. D. WHITNEY: Report of a Geological Survey of the Lead Region of the Upper Mississippi. Extracted from the First Volume of the Geological Survey of Wisconsin, pp. 73–424. Albany, N. Y., 1862.

E. HOLMES AND CHARLES H. HITCHCOCK: General Reports on the Geology and Natural History of Maine; comprises 360 pages of the Sixth Annual Report of the Maine Board of Agriculture. 8vo, pp. 464. Augusta, 1861.

A. WINCHELL: First biennial Report of the progress of the Geological Survey of Michigan, embracing observations on the Geology, Zoölogy and Botany of the Lower Peninsula. 8vo, pp. 339. Lansing, 1861.

Description of Species.

Adamsite.—See MARGARODITE.

ALGODONITE [Suppl. V].—Dr Genth has identified this mineral as occurring with *whitneyite* from Lake Superior (see WHITNEYITE). It is more granular than the associated whitneyite; it has a grayish-white color and metallic lustre, and when polished is almost silver white. The purest of it forms the lining of little cavities as minute crystals, too indistinct to determine their form. Analysis shows that the composition is very nearly that of *algodonite*, although a slight admixture of whitneyite generally gives the arsenic a little too low. Dr. Genth has also analyzed a specimen of algodonite from Cerro de los Seguas (Dept. Rancagua, Chile). The Chile mineral had a density of 7·62; hardness, about that of fluor; color, steel-gray to silver white; fracture, sub conchoidal; brittle; lustre, on fresh fracture, metallic but becoming dull on exposure; associated with cuprite, barytes, malachite, etc. Analysis of the mineral from the two localities gave:

	As	Cu	Ag		
1. Lake Superior,	15·30	84·22	0·32	=	99.84
2. "	undet.	84·10	0·34		
3. "	16·72	82·35	0·30	=	99·37
4. Chile,	17·46	81·82	*tr.*	=	99·28
5. "	16·94	82·33	*tr.*	=	99·27
6. "	16·44	83·11	*tr.*	=	99·55

Nos. 1 and 2 appear to have contained a small admixture of whitneyite. Nos. 3, 5 and 6 give almost exactly the formula $Cu_{12}As$=As 16·50, Cu 83·50—(this Journal, xxxiii, 192).

ALISONITE [Suppl. VII].—F. Field gives a new analysis of this species, in which he found:

S	Cu	Pb		
17·69	53·28	28·81	=	99·78

This agrees very closely with the former analysis, and gives the formula 3CuS+PbS=S 17·78, Cu 53·34, Pb 28·88.—(*Quar. Jour. Chem. Soc.*, xiv, 160.)

ALLANITE [p. 208, I—VI, VIII].—D. M. Balch has found *orthite*, associated with quartz and feldspar, at Swampscot, Mass. It is massive; color, jet black; streak, gray; G.=3·69-3·71 at 18° C. B.B. fuses to a black blistered glass; with borax and soda gives reactions for iron and manganese. Composition:

	Si	Al	Fe	Ce	Y	Ca	Mg	Na	H	
1.	33·31	14·73	15·82	21·94	1·32	7·85	1·25	undet.	1·49	=97·71
		Al Fe								
2.	32·94	33·60		20·71	1·32	7·87	1·47	"	1·49	=99·40

The mineral in its natural state is decomposed by chlorhydric acid, but after ignition is not affected by it. It very nearly corresponds in composition with the orthite from Hitteroe—(this Journal, [2], xxxiii, 350).

Analysis of *allanite* from Franklin, New Jersey, by T. S. Hunt (Proc. Bost. Soc. Nat. Hist., viii, 57). The mineral is associated with feldspar, and was found by Dr. Jackson, in the old Magnetic Iron Mine at Franklin. Sp. Gr.=3·84. Partially decomposed by hot chlorhydric acid, with separation of flocculent silica. Composition;

Si	Al	Fe	Ce	La Di	Ca	Mg	Mn	Ign.
30·20	13·05	18·25	16·60	6·90	11·76	1·70	*tr.*	1·30

ALUNITE [p. 388, V].—Analyses of native *alunite*, from Talfa, Italy, and Muzsai, Hungary, by A. Mitscherlich.—(*Jour. pr. Chem.*, lxxxiii, 464.)

	Al	S	Ca	Ba	K	Na	H
Tolfa,	36·83	38·63	0·70	0·29	8·99	1·84	12·72
Muzsai,	39·15	36·93	0·49	0·19	10·67	—-	12·57

Mitscherlich considers that the rational composition is best expressed by the formula $K S+Al S^3+2Al H^3$, as the water is not expelled below the temperature of boiling sulphur, and moreover, when expelled, the residue consists of anhydrous alum and alumina.

ANGLESITE [p. 370, II, III].—F. Field has examined a black amorphous variety of sulphate of lead, from a mine near Coquimbo, Chile. It occurred in large black masses, in the centre of which a small vein of galena was running. It had a black earthy appearance, and was without metallic lustre. The argentiferous galena forming the nucleus of the mass, contained appreciably more silver than the exterior sulphate. G.=6·20. Composition:

Pb S	Fe	Ag		
96·74	3·16	*tr.*	=	99·90

(*Quar. Jour. Chem. Soc.*, xiv, 156.)

Antozonite.—See FLUOR.

APHROSIDERITE [p. 297, I].—Erlenmeyer gives analyses of a mineral resembling *aphrosiderite*, from two iron mines; one at Muttershausen, in Nassau, the other at Balduinstein. The streak of the mineral from both localities is apple-green.

	Si	Al	Fe	Fe	Mg	H	
1. Muttershausen, G.=2·99	25·72	20·69	4·01	27·79	11·70	10·05	=99·96
2. Balduinstein, G.=3·01	25·99	——	4·13	27·60	11·93	10·13	

Corresponding very closely with the *aphrosiderite* analyzed by v. Hauer, from Upper Styria (Supp. I).—(Kopp's *Jahresbericht*, 1860, 773.)

APOPHYLLITE [p. 304, V].—Analysis of the pink *apophyllite*, from Andreasberg, by H. Stölting:

Si	Ca	K	H		
51·73	25·02	5·10	15·73	=	99·58

No fluorine is given.—(*B. and H. Zeitung*, xx, 267.)

ARSENICAL-ANTIMONY [p. 22].—An interesting variety of this mineral, from the Ophir Mine, Nevada Territory, has been described and analyzed by F. A. Genth. Occurs in reniform, finely crystallized, somewhat radiated masses. Color on fresh fracture between tin-white and iron-black, but grayish-black on exposure. Composition, after excluding impurities, As 90·82, Sb 9·18—(this Journal, [2], xxxiii, 190).

ARSENOLITE [p. 139,].—Dr. Genth has found *arsenolite*, associated with arsenical-antimony, in specimens, from the Ophir Mine, Nevada Territory—(this Journal, [2], xxxiii, 190).

Automolite.—See SPINEL.

BIHARITE [*K. F. Peters Ber. Wien. Akad.* xliv, 133].—Peters gives this name to a mineral from Werksthal near Retzbanya, which has previously passed under the name of *agalmatolite*. It is a massive, compact micro-crystalline substance associated with fine granular limestone. The mass has a greasy feel and adheres somewhat to the tongue. It is slightly brittle, fracture uneven to splintery-conchoidal. H.=2·5. G.=2·737 (yellow variety). Color yellow and green—from brown and cloudy wine-yellow to leek green. Small splinters are transparent, all varieties translucent. Streak white. Lustre, greasy to pearly, with polarization microscope shows double refraction. Rubbed with silk gives positive electricity. B.B. in closed tube yields water and becomes white or grayish white. The green variety is infusible, and the yellow variety fuses only on the edges. With cobalt solution gives first a rose-red, and after longer heating, a violet color. Does not gelatinize with acids. A specimen of an apparently homogeneous variety of a wine-yellow to oil-green color analyzed by M. Soltesz gave,

Si	Al	Fe	Ca	Mg	K	Na	H	C
39·80	12·83	*tr.*	6·68	27·49	4·63	*tr.*	4·24	2·05=97·72

The carbonic acid was due to limestone mechanically mixed with the mineral. Peters remarks that, he "is far from considering this silicate as a well characterized mineral." To establish this point, he says "that it would be first necessary to have analyses of all the different varieties, still in order to induce further investigation, he names it *biharite*, after the mountain in which it occurs." We feel justified in remarking, that if the mineral is not "well characterized," the author is somewhat premature in giving it a new name. We question very much the propriety of adding a new name to science, without full and just grounds, under the plea of inducing further investigation. It is gaining the credit of naming a species, while throwing the burden of investigation on others.

BISMUTH [p. 20, VIII].—A remarkable vein, containing metallic bismuth, has been opened at the Atlas Mine, in Devonshire. The vein is three feet in width, and the bismuth constitutes one-sixteenth of the whole mass, having a value of £300 to the fathom.—(*Dingler's Polytechnisches Journal*, clix, 76.)

BORACITE [p. II, III–VIII].—Analysis of stasfurthite, by Kromayer (Ludwig, in

Kopp's *Jahresbericht*, 1859, 816). The mineral was washed with cold water, to free it from adhering chlorid of magnesium. The insoluble portion gave:

Mg Cl	$\dot{M}g$	$\dot{H}$	$\ddot{B}^a$
9·97	24·93	6·20	58·90

[a] By difference.

giving the formula $2(\dot{M}g^3\ddot{B}^4+\dot{H})+MgCl,\dot{H}$ or two equivalents more of water than obtained by Heintz and Potyka.

Boronatrocalcite [see Hayesine, p. 394, V, VIII].—H. How has given the name *cryptomorphite* to a hydrous borate of lime and soda, which is found in gypsum, near Windsor, Nova Scotia (this Journal, [2], xxxii, 9). It occurs in cakes, or rounded masses, of the size of a small pea or bean, laying between crystals of glauber salt and gypsum. Color, white; lustreless; soft, H.=1, but coherent; tasteless; slightly tough between the teeth. B.B. fuses easily to a clear bead; insoluble in water; soluble in chlorhydric acid. On exposure to the air, loses 18·36 per cent of water. With a magnifying power of 350 diameters, Prof. Robb found the mineral to be distinctly crystalline, with a rhombic structure, and differing in form very materially from the natro-borocalcite found at the same locality. Composition of the air-dried mineral:

$\dot{C}a$	$\dot{N}a$	$\ddot{S}$	$\dot{M}g$	$\dot{H}$	$\ddot{B}$
14·21	7·25	3·98	0·62	19 96	53·98

Assuming the magnesia and sulphuric acid to be accidental, and deducting the magnesia as $\dot{M}g\ddot{S}+7\dot{H}$, and the remaining sulphuric acid as $\dot{N}a\ddot{S}$, How obtains $\dot{C}a$ 15·55, $\dot{N}a$ 5·61, $\dot{H}$ 19·72, $\ddot{B}$ 59 10, corresponding to the formula $\dot{N}a$, $3\dot{C}a$, $9\ddot{B}+12\dot{H}$, or $\dot{N}a\ddot{B}^4+\dot{C}a^3\ddot{B}^5+12$ aq. [We have placed this mineral under *boronatrocalcite*, as, according to our view, this name expresses sufficiently well its composition and relations in the classification of hydrous borates. If we were to calculate formulæ for all of the published analyses of hydrous borates of lime and soda, we should have at least a dozen different compounds represented. No one believes that these are all distinct mineral species, and until repeated analyses are made, which prove the definite and invariable composition of the mineral from any given locality, we may well hesitate before creating or adopting any more new species. The hydrous borates of lime and soda have already rather an excess of synonyms; for the lime borate we have hayesine, borocalcite and hydroborocalcite; for the lime and soda borate: boronatrocalcite, ulexite, tinkalzite, tiza, natroborocalcite, and now cryptomorphite. That there are two distinct species, hayesine and boronatrocalcite, does not admit of a doubt, but as the composition of neither of these is definitely settled, we are not yet willing to admit that these names, as at present applied, each represent three or four distinct mineral species.—G. J. B.]

Bournonite [p. 80, V].—F. Field has found this species at a mine near Huasco, in northern Chile. The specimen was crystallized. H.=2·5, G.=5·80. It resembled in every respect the *bournonite* from Cornwall. Field gives analyses of both the Chilean and Cornish minerals, with the following results:

	S	Sb	Pb	Cu	
Huasco,	20·45	26·21	40·76	12·52	= 99·94
Cornwall,	20·30	26·30	40·80	12·70	= 100·10

These analyses correspond in a most remarkable manner with Rose's analysis of the Pfaffenberg *bournonite*.—(*Quar. Jour. Chem. Soc.*, xiv, 158.)

Brucite [p. 133, I, II-IX].—R. Hermann has given the name *Texalite* to the hydrate of magnesia from Texas, Pennsylvania, and has attempted to show that its form was monoclinic, and that $\dot{M}g\dot{H}$ was consequently dimorphous (*Jour. für prakt. Chem.*, lxxxii, 368). The writer has already proved, from the examination of a large number of crystals, that this conclusion was erroneous (this Journal, xxxii, 94), and that the form of the Texas mineral is rhombohedral, as already determined by Dana, and, previous to the publication of Hermann's paper, it had also been determined by Kenngott and G. Rose (*Zeitschrift der Geol. Gesellschaft*, xiii, 178). The paper by Rose had not then been received here, or it would have been quoted in answer to Hermann. The crystals examined by Rose and myself were hexagonal

prisms, with rhombohedral planes R and $-\frac{1}{2}R$. Since the publication of these results, Hessenberg has published, in No. 4 of his "Notizen," an examination of the crystalline form of this species, which also shows it to be rhombohedral. To this we may add, that Dr. Auerbach found that its optical properties were those of a rhombohedral substance, an observation which we are able to substantiate.

With such an accumulation of facts from five different authorities, it may safely be assumed that texalite does not differ from ordinary rhombohedral *brucite*.

An analysis of the Texas mineral gave Hermann:

$\dot{M}g$	$\dot{M}n$	$\dot{H}$
68·87	0·80	30·33

CALAMINE [p. 313, II–VII].—The name *wagite* has been given by Radoszkovski, to a concretionary silicate of zinc from Nijni-Jagurt, in the Ural (*Comptes Rendus*, liii, 107). It occurs in concretionary crusts, which, when examined by the magnifier, show indistinct crystals. Color, light blue to green. H.=5, Sp. gr.=2·707. Soluble in acids. Composition:

	$\ddot{S}i$	$\dot{C}a$	$\dot{Z}n$	$\dot{H}$	$\dot{C}u\,\dot{F}e$		
	26·00	1·55	66·90	4·70	*tr.*	=	99·15
Oxygen,	13·87	·44	13·21	4·18			

giving the ratio for $\ddot{S}i$, $\dot{Z}n$, H, 3 : 3 : 1½. The author, by an error in calculation makes the ratio 3 : 3 : 1; the composition and ratio are so near those of Calamine, that for the present we may safely consider wagite a variety of this species. The, only anomalous property is the specific gravity, which is considerably less than that given for Calamine.

CANCRINITE [233, II–VIII].—G. Tschermak has examined *cancrinite*, from Ditro in Siebenbürgen. It is found in loose masses, with sodalite, elæolite and orthoclase. Color, pale flesh-red; cleaves perfectly, yielding hexagonal prisms. H.=5–5·5, G.=2·42. Composition:

$\ddot{S}i$	$\ddot{A}l$	$\dot{C}a$	$\dot{N}a$	$\dot{H}$	$\ddot{C}$		
37·2	30·3	5·1	17·4	4·0	5·2	=	99·2

not differing materially from the composition of cancrinite from the Ural and from Maine.—(*Ber. Wien. Akad.*, xliv, 134.)

CERVANTITE [p. 141].—T. L. Phipson has examined a native oxyd of antimony from Borneo, which is identical with this species (*Comptes Rendus*, lii, 752). It is associated with stibnite, and occurs as a compact crystalline substance, of a yellowish or reddish-white color and yellowish-white streak.

Isolated crystals, of half an inch in length, were also found, having the form of the right-rhomboidal prism, terminated by two planes with modifications; they had a pearly lustre, and were horizontally striated. In the closed tube, the mineral was non-volatile and unaltered, thus distinguishing it from SbO_3. B.B. infusible, thus differing from SbO_5. Pure specimens were entirely volatile in the reducing flame, but unaltered in the oxydizing flame. These reactions, in connexion with the following analysis, show the mineral to be SbO_4. With soda gives metallic antimony. The specimen analysed contained stibnite, sulphur, oxyd of iron and alumina as impurities. Composition:

	SbO_4	$\dot{H}$	$\ddot{F}e\,\ddot{A}l$	$\ddot{S}i$, S, etc.		
G.=4·64–4·68	65·00	3·75	10·00	21·25	=	100·00

[Phipson considers the water as combined with the antimony, giving the formula SbO_4, HO, and refers the mineral to Beudant's species *stibiconite*, but as we infer from his description that the pure mineral was unaltered in the closed tube, we may assume that the water was combined with the iron, alumina, and other impurities mentioned.—G. J. B.]

CHABAZITE [p. 319, II].—Analysis of *chabazite* from Oberstein gave G. Schrœder:

$\ddot{S}i$	$\ddot{A}l$	$\dot{C}a$	$\dot{B}a$	$\dot{S}r$	$\dot{N}a$	$\dot{K}$	$\dot{M}g$	$\dot{H}$	
50·19	17·45	7·13	0·48	0·32	2·12	0·62	*tr.*	22·09	=100·40

—Kenngott, *Uebersicht*, 1860, 56.

CHLORITE [p. 294, IV, V–VIII,].—Genth has described a chlorite-like mineral from Webster, N. C., which he considers a result of the alteration of chrysolite. It occurs in what appear to be rhombohedral plates, and the crystals, though indistinct, present triangular basal and rhombohedral planes. Cleavage, basal and highly perfect. H=2·5. Color, dark bluish to brownish-green; translucent. B.B. exfoliates slightly and becomes silver-white. Infusible. The material for analysis was too small to have it of uniform color.

	$\ddot{S}i$	$\dot{A}l$	$\dot{C}r$	$\dot{F}e$	$\dot{N}i$	$\dot{M}g$	$\dot{C}a$	$\dot{K}$	Ign.
1.	31·15	13·70	4·16	4·83	0·16	undet.	0·17	undet.	3·29
2.	31·75	12·45	undet.	4·94	undet.	43·10	undet.	0·06	undet.
Mean,	31·45	13·08	4.16	4·88	0·16	43·10	0·17	0·06	3·29=100·35

These results place the mineral near pyrosclerite and chlorite. The small amount of water is remarkable, especially when taken in connection with the anhydrous talc from the same locality--(this Journal, [2], xxxiii, 200).

Shepard's *rastolyte*, from Monroe, New York, is shown by Pisani to be a *ferruginous chlorite* (*Comptes Rendus*, liv, 468). Pisani observes, that although the mineral is somewhat acted upon, it is not entirely decomposed by acids. After deduction of the iron pyrites with which it is intimately associated, the composition was found to be:

$\ddot{S}i$	$\dot{A}l$	$\dot{F}e$	$\dot{M}g$	$\dot{H}$		
34·98	21·88	28·44	6·24	9·22	=	100·76

All the iron was in the state of protoxyd. A former analysis by Shepard made the composition near that of stilpnomelane (see Suppl. IV); but this analysis is undoubtedly incorrect, as Pisani has proved that the mineral is only partially decomposed by acid, so that results obtained from an attempted decomposition by acids must be erroneous. The physical properties and chemical composition of the mineral render it extremely probable that it is an impure variety of chlorite.

CHRYSOCOLLA [p. 309, II–VIII].—F. Field has published an interesting paper on the silicates of copper from Chile (*L. E. D. Phil. Mag.*, [4.] xxii, 361). A variety from Tambillos, near Coquimbo, having a turquoise-blue color, perfectly amorphous and opaque, gave on analysis: $\ddot{S}i$ 28·21, $\dot{C}u$ 39·50, $\dot{H}$ 24·52, $\dot{F}e$ 2·80, $\dot{A}l$ 4·97. Excluding the iron and alumina, as foreign to the mineral, we have $\ddot{S}i$ 30·59, $\dot{C}u$ 42·83, $\dot{H}$ 26·58 or $\dot{C}u\,\ddot{S}i+3\dot{H}$. Other analyses are given of substances which do not appear to be definite compounds.

CHRYSOLITE [p. 184, I–IV, VI].—F. A. Genth has analyzed two varieties of *chrysolite*, occurring in talc-slate, at Webster, Jackson Co., N. Carolina: 1. pale grayish-green, granular and very friable, G=3·28 (12° C); 2, less friable, of darker yellowish olive-green color, G.=32·52.

	$\ddot{S}i$	$\dot{F}e$	$\dot{N}i$	$\dot{M}g$	$\dot{C}a$	Chrome-iron and quartz.	Ign.
1.	41·89	7·39	0·35	49·13	0·06	0·58	0·82=100·21
2. (*a*,)	40·37	7·39	0·50	——	——	1·27	0·50
2. (*b*,)	40·74	7·26	0 39	49·18	0 02	1·83	0·76=100·18

with traces of alumina, oxyds, of cobalt and manganese, associated with chrome-iron, talc, serpentine, and a mineral resembling pyrosclerite. Dr. Genth expresses the opinion, that the specimens give evidence that chrysolite is probably the mineral from which talc-slate, and many of the serpentines have been formed—(this Journal, [2], xxxiii, 199).

For analysis of altered olivine from Ihringen, in Breisgau, by Lewinstein, see Kopp, *Jahresbericht*, 1860, 757.

CLINOCHLORE [p. 293, I, II, V–IX].—Analysis of *clinochlore* from Achmatowsk, by H. Struve:

$\ddot{S}i$	$\dot{A}l$	$\dot{F}e$	$\dot{M}g$	$\dot{C}a$	$\dot{H}$		
31·64	13·54	5·83	36·20	0·05	12·74	=	100
31·52	13·96	6·12	35·68	0·05	12·67	=	100

Mat. Min. Russlands, iii, 236, in Kopp's *Jahresbericht*, 1860, 772.

COPIAPITE [p. 387, I, III, IV].—A new analysis of *fibroferrite*, from Chile, by F. Field, (*Quar. Jour. Chem. Soc.*, xiv, 156,) shows that this mineral loses water on exposure to the air. The mineral is found in botryoidal masses, each rounded nodule being built up of innumerable silky fibres diverging from a centre, and having a golden green color. An analysis gave the formula $\dot{F}e\,\ddot{S}^2+10\dot{H}$. On exposure to the air for two weeks it lost two equivalents of water; a longer exposure of many months produced no further change in composition. Heated at 212° F. it was converted into $\dot{F}e\,\ddot{S}^2+3\dot{H}$.

COPPER [p. 17, IV, VI-IX].—The pseudomorphous crystals of copper after aragonite, described by Kenngott (Suppl. V), have been examined by D. Forbes, (*Quar. Jour. Geol. Soc.*, London, xvii, 45). Crystals are found in the copper mines of Corcoro, in Peru. They are hexagonal; some consist entirely of copper, while others have a nucleus of carbonate of lime, from which Forbes infers that the pseudomorphs have been formed by the action of a solution of copper on crystals of carbonate of lime, and by some subsequent chemical change the carbonate of copper thus formed has been reduced to the metallic state. An analysis of one of the crystals, by Kroeber, gave:

Cu	Si	Ag	Fe*	Insol.		
98·605	0·015	*tr.*	1·376	0·004	=	100·00

* By difference.

F. Alger has described what he considers to be a rhombohedron of copper, from Copper Falls Mine, (Lake Superior). It is associated with rhombohedral carbonate of lime, and the copper is thought by Alger to be pseudomorphous of calcite. Dr. Jackson suggests that the crystal may be a cube, which slightly distorted, gives it a rhombohedral aspect (*Proc. Bost. Soc. Nat. Hist.*, viii, 171).

COPPER GLANCE [p. 46, 505].—Dr. Genth has made a very elaborate series of analyses of the so-called *harrisite*, from the East Tennessee Mine, Polk Co., Tenn., which entirely substantiate his former opinion, that "harrisite was copper-glance pseudomorphous after galena." Dr. Genth mentions that Dr. Torrey first discovered specimens of *harrisite* from Canton Mine, which contained a nucleus of *unaltered galena*, and soon after Mr. Trippel, of the Tennessee Copper Mines, discovered this same pseudomorph at the East Tennessee Mine, at which latter place it is found in a feldspathic rock, associated with chalcopyrite, pyrites, blende, garnet and lime-epidote. The Tennessee specimens have a color between dark lead gray and bluish black. They frequently contain a nucleus of almost unaltered galena; some specimens are almost pure copper-glance, while others are intermediate between copper-glance and galena, as shown by the analyses. The rational composition deduced from the analyses of seven specimens gave the following:

	1.	2.	3.	4.	5.	6.	7.
Galena,	97·41	26·93	14·50	13·14	3·29	1·24	0·47
Silver-glance,	0·83	0·24	0·57	0·83	1·26	0·23	0·18
Covelline,	1·41	——	5·02	4·11	4·70	2·20	9·03
Copper-glance,	——	70·26	78·82	81·05	89·89	93·80	80·70
Pyrites,	0·43	3·20	1·09	0·86	0·86	1·39	8·81

Analysis 2 by Trippel, the others by Genth. The author queries whether alisonite, $3Cu_2S+PbS$, and cuproplumbite $Cu_2S+2PbS$ may not also prove to be pseudomorphs of copper-glance after galena in an unfinished condition—(this Journal, [2], xxxiii, 194).

COPPER-NICKEL [p. 52, VI-VIII].—Analysis of *copper-nickel* from Andreasberg by H. Hahn (*B. and H. Zeitung*, xx, 281):

Ni	Co	As	S	Fe	Insol.		
23·75	10·81	50·94	5·69	0·83	8·80	=	100·82

Cryptomorphite.—See BORONATROCALCITE.

DATHOLITE [p. 334, I-IV, VI, VIII].—G. Tschermak has analyzed the transparent crystallized *datholite*, from Toggiana. He found $\ddot{S}i$ 38·2, $\dot{C}a$ 34·9, $\dot{H}$ 5·7, $\ddot{B}$ (by loss) 21·2. G.=3.—(*Kenngott, Uebersicht*, 1860, 57.)

The peculiar massive *datholite* described by J. D. Whitney (this Journal, [2], xxviii, 13), has been further examined by A. A. Hayes (*Proc. Bost. Soc. Nat. Hist.*, viii, 62). The specimens examined were from the Isle Royale, Quincy, Marquette, Minnesota and "Ash-bed" mines. The mineral is compact, resembling some varieties of Wedgewood-ware. H.=5·5. Other physical properties the same as already given by Whitney. Analyses of two specimens gave:

$\dot{S}i$	$\dot{B}$	$\dot{C}a$	$\dot{F}e\dot{A}l$	$\dot{C}u$	$\dot{H}$	quartz.		
38·32	22·64	32·82	1·04	0·80	3·98	0·80	=	99·68
37·92	22·16	33·64	—	—	3·96	2·08	=	99·76

It contains less water than is given for crystallized datholite, and Dr. Hayes suggests the possibility that in former analyses the water may have been given too high, owing to loss of boric acid by exposure to intense ignition.

[Dr. Hayes calls attention to this mineral as being sometimes confounded with pectolite. It is quite remarkable that datholite, pectolite and wollastonite are all found at Lake Superior in compact masses, differing entirely in appearance from these minerals as found at other localities. The compact datholite is of frequent occurrence; during the past summer I observed it at many of the mines in the Portage Lake, Keweenaw and Ontanagon districts. Very fine specimens occur at the Superior Mine near Ontanagon.—G. J. B.]

Dechenite [p. 362, III, IV, VIII].—The *rhombic vanadinite* from Kappel in Carinthia, described by Zippe, has been analyzed by G. Tschermak (*Wien. Akad. Ber.*, xlvi, 157).

	$\dot{P}b$	$\dddot{V}$	
G.=5·83.	54·3	45·7	= 100.

A trace of zinc was also found. Tschermak considers it as identical with *dechenite*.

DELEMINZITE—*Breithaupt, Berg und Hüttenmännische Zeitung*, xxi, 98.—Breithaupt gives this name to what he considers to be a new form of sulphid of silver, differing from silver-glance and akanthite. It is isomorphous with copper-glance. The angle of the prism was determined to be 116°. G.=7·02. Named after Deleminzin, the ancient name for Freiberg. Locality of the mineral not stated, but it is probably from Freiberg.

Dianite [Suppl. IX].—Damour and Deville have shown that v. Kobell's dianic acid is identical with hypocolumbic acid, consequently this mineral can no longer be considered as distinct from tantalite.—(*Comptes Rendus*, liii, 1,044.)

Domeykite [p. 36, V].—F. A. Genth confirms the observations of Hunt and Whitney in regard to the occurrence of a mixture of domeykite and copper-nickel in the ore from Michipicoten Island. He also gives analyses of the domeykite recently found on the Sheldon location at Portage Lake. It is massive; hardness, a little below that of fluor. G. at 16° C. 7·75. Color, on fresh fracture, tin-white to steel-gray, quickly tarnishing, first into yellow and pinchbeck, afterwards showing pavonine tints, and finally becoming brown. Lustre, metallic when fresh, but dull after exposure. Fracture uneven, subchonchoidal. Associated with quartz and arseniate of copper. Analyses:

	As	Cu		
1.	29·25	70·68	=	99·93
2.	29·48	70·01	=	99·59

Analysis I contained 0·55, and II. 6·71 pr. ct. quartz. Excluding the quartz, they give the formula Cu^3As=As 29·25. Cu 71·68—(this Journal, xxxiii, 193).

Analysis of *domeykite* from the Corocora Copper Mines, by D. Forbes (*Quar. Jour. Geol. Soc.*, xvii, 44):

Cu	Ag	As
71·13	0·46	28·41

It was found in the form of gray metallic grains, disseminated in sandstone.

Dufrenite [p. 427, IV].—F. Pisani has analyzed *dufrenite*, from Rocheforten-Terre, (Morbihan, France.) where it occurs in dark green kidney-shaped masses, with limonite and cacoxene (?). Composition:

$\dot{P}$	$\dot{F}e$	$\dot{A}l$	$\dot{H}$		
28·53	54·40	4·50	12·40	=	99·83

giving the oxygen ratio for $\dot{P}$, $\dot{F}e$, $\dot{H}$, 10 : 12 : 7, or $2(\dot{F}e\ \dot{A}l)^2\dot{P}+7\dot{H}$.—*Comptes Rendus*, liii, 1020.

Engelhardite.—See ZIRCON.

EPIDOTE [p. 206, II-VII, IX].—Dr. Genth has described an interesting variety of *lime-epidote*, from the Polk County Mine, Tennessee. It occurs in large but indistinct crystals, lengthened parallel to *ii*, which plane is best developed and can be seen on every crystal; some crystals also show the planes $1i$ and $\frac{1}{2}i$. Cleavage very distinct parallel to *ii*. The color is gray, with a bluish-green or greenish-brown tint. (Some specimens are white, with a tinge of pink.—G. J. B.) G.=3·344. The larger crystals are frequently intermixed with chalcopyrite, pyrites and quartz. Analyses No. 1, by Genth, No. 2, by Trippel, of a coarse grained, confusedly crystalline variety, partially decomposed, and associated with blende, harrisite, garnet, etc.

	$\dot{S}i$	$\dot{A}l$	$\dot{F}e$	$\dot{M}n$	$\dot{C}a$	$\dot{M}g$	$\dot{C}u$	$\dot{K}$	Ign.
1.	40·04	30·63	2·28	0·19	25·11	*tr.*	0.24	—	0·71=99·20, Genth.
2.	43·20	29·60	2·88	—	22·72	0·56	—	*tr.*	0·26=99·22, Trippel.

Other partial analyses are given—(this Journal, [2], xxxiii, 197).

FELDSPAR [p. 228, I-III, IX].—S. D. Hayes has investigated the properties of fused feldspar (*Pogg. Ann.*, cxiii, 468). His results show that feldspar suffers no material change in its composition by fusion. [It is well known that feldspar is found as a furnace-product.—G. J. B.]

For analyses of *orthoclase*, from Lauterberg and Holzemmenthal, made in the Clausthal Laboratory, see *B. und H. Zeitung*, xx, 265. Analysis of *glassy feldspar*, from Löwenburg, by G. vom Rath, *Zeitschr. Geol. Gesellsch.*, xii, 44. For other analyses, see Kenngott, *Uebersicht*, 1860, 63-65.

FICHTELITE [p. 472, V].—T. E. Clark shows the crystals of this resin to be monoclinic. The crystals obtained were from a solution in alcohol and ether (*Ann. d. Chem. u. Pharm.*, cxix, 226).

FLUOR [p. 94, II].—The fetid *fluor* from Wölsendorf, in the Palatinate, in which Schafhäutl thought to have discovered hypochlorite of lime (Min. 94), has been examined by Schrötter, (*Sitzungsber. Acad. d. Wissensch., Wien*, xli), who announces that the so-called hypochlorous acid is ozone. More recently the same variety of fluor has been examined by Schönbein, and, according to his views, the so-called ozone is antozone (*Jour. prakt. Chem.*, lxxxiii, 95). Schönbein estimates that the mineral contains $\frac{1}{5000}$ part of its weight (·02 pr. ct.) of this substance, and suggests that this variety of fluor should be called *antozonite*. This very convenient designation should not be received into mineralogical nomenclature as a synonym of fluor, much less as the name of a new species.

FREIESLEBENITE [p. 99, III, IV].—A. Reuss announces the discovery of this rare mineral, at Przibram, in Bohemia. It is found in isolated crystals, from two to six lines in length; usually the crystals are twined. Prismatic cleavage, perfect; fracture, uneven to sub-conchoidal. H.=2·53. G.=6·23. Color steel-gray to blackish-gray. B.B. decrepitates and gives reactions for sulphur, antimony, lead and silver. Analysis by Von Payr:

Sb	S	Ag	Pb	Fe		
27·11	18·41	23·08	30·77	0·63	=	100 00

Lotos, 1859, p. 51-56, in *Jahrb. Min*, 1860, 579.

Fournetite.—See TETRAHEDRITE.

GALENA [p. 39, II-IV, VII-VIII].—Breithaupt has examined the so-called pseudomorphs of galena, after pyromorphite from Bernkastel, on the Mosel, and concludes that they are not pseudomorphs, but true hexagonal prisms of sulphid of lead. He finds that they possess no trace of cubic cleavage, but that they have a perfect basal

cleavage and an imperfect prismatic cleavage. The crystals often occur with pyromorphite. Some specimens of stalactitic sulphid of lead, examined by Breithaupt, were also found to have this peculiar cleavage. Breithaupt considers that the low specific gravity of the crystals, 6·82 to 6·87, is remarkable, but he gives no chemical analysis to prove that substance he examined was pure sulphid of lead; it may have contained unaltered *pyromorphite*. He proposes the name *sexangulite* for this variety of galena (*B. and H. Zeitung*, xxi, 99).

For Dr. Genth's paper on copper-glance, pseudomorphous of *galena*, see COPPER-GLANCE.

Gamsigradite.—See HORNBLENDE.

GARNET [p. 190, I–IX].—Analysis of green garnet, from serpentine at Dobschau, in Hungary, by Tschermak: $\dot{S}i$ 38, $\dot{F}e$ 28, $\ddot{A}l$ 3, $\dot{C}a$ 30, $\dot{M}g$ 2=101. G=3·72.—*Kopp's Jahresbericht*, 1860, 766.

GLAUBERITE [p. 374].—Pisani has found a brick-red friable and resinous-like variety of *glauberite*, associated with polyhalite and anhydrite, in common salt, at Varengeville, near Nancy. Composition: $\dot{N}a\,\ddot{S}$ 50·50, $\dot{C}a\,\ddot{S}$ 48·78, clay 0·40= 99·68.—(*Comptes Rendus*, li, 731, in Kopp's *Jahresbericht*, 1860, 788.)

Glossecollite.—See HALLOYSITE.

GOLD [p. 7, I, II, V–VII, IX].—O. C. Marsh, in a paper on the Gold of Nova Scotia, gives analyses of gold from Tangier and Lunenburg:

		Au	Ag	Cu	Fe		
Tangier,	G.=18·95	98·13	1·76	·05	*tr.*	=	99·94
Lunenburg,	G.=18·37	92·04	7·76	·11	*tr.*	=	99·91

A specimen from Lawrencetown had a density of 18·60, indicating a composition between that of the Tangier and the Lunenburg specimens. The Tangier gold is remarkable for its purity, being only surpassed in this respect by that from Schabrowski (this Journal, xxxii, 399).

F. A. Genth has found Gold pseudomorphous of *aikinite*. The exact locality of the specimen was doubtful, but was stated to be from Georgia. A portion of the aikinite was unaltered, but it was mostly converted into the well-known pseudomorph, a cupreous carbonate of bismuth. This latter was found in slender needles, of different degrees of purity; lustre, waxy; color, pistachio or oil green; when earthy, greenish-white. In the centre of many of the crystals was bright yellow gold, of a high degree of fineness, in some cases distinctly showing the rhombic form of the original mineral (this Journal, [2], xxxiii, 190).

J. Tennant describes a mass of gold found at Bakery Hill, Ballarat, in Australia, in 1858, which weighed 2 217 ounces, or 184 pounds 8 ounces. It was melted in London, in September, 1859, and yielded £8,376 10s. 10d. sterling of Gold.—(*Pogg. Ann.*, cxii, 644, *Brit. Assoc. Report*, 29th Meeting, p. 85.)

GYROLITE [p. 305, I].—H. How has discovered *gyrolite* near Margaretville, Nova Scotia. It occurs imbedded in crystalline apophyllite in spherical concretions of pearly lustrous plates, varying in size from a pin's-head to nearly half an inch in diameter. Composition:

$\ddot{S}i$	$\dot{C}a$	$\ddot{A}l$	$\dot{M}g$	$\dot{K}$	$\dot{H}$		
51·90	29·95	1·27	0·08	1·60	15·05	=	99·85

giving the formula, $\dot{C}a\,\ddot{S}i + 1\frac{1}{2}\dot{H}$, and corresponding nearly with Anderson's analysis of the mineral from the Isle of Skye. How calls attention to the close relation of this mineral to apophyllite, and suggests that the existence of carbonate of lime in the cavities with the gyrolite, would seem to show that the latter is formed from apophyllite by the waters which deposited the carbonate of lime, reacting on the silicate of potash, and dissolving out at the same time the fluorid of calcium (this Journal, [2], xxxii, 13).

HALLOYSITE [p. 251, VII].—F. Pisani has analyzed Shepard's *glossecollite*, and proved it to be identical with *halloysite* (*Comptes Rendus*, lii, 310). The specimen examined was received from Des Cloizeaux, who gives the following characters for

the mineral. It is compact, with conchoidal fracture; dull, but becomes lustrous on rubbing; color, white; soft and very friable; adheres strongly to the tongue. In water does not soften, but becomes translucent and opaline on the edges, disengaging a few bubbles of air and an argillaceous odor. Heated in the closed tube gives off water, and becomes bluish-gray. B.B. infusible, with cobalt solution gives a blue color. Decomposed by sulphuric acid. Composition:

$\ddot{S}i$	$\dot{A}l$	$\dot{M}g$	$\dot{H}$		
40·4	37·8	0·5	21·8	=	100·5

Shepard described it as pure hydrated silicic acid ($Si\,O_3$, HO).

Harrisite.—See COPPER-GLANCE.

HAUYNE [p. 230, IX].—Analysis of *hauyne*, from the lava of Melfi, by Rammelsberg:

	$\ddot{S}$	$\ddot{S}i$	$\dot{A}l$	$\dot{C}a$	$\dot{M}g$	$\dot{N}a$	$\dot{K}$	Cl	
G.=24·66	11·08	34·88	29·34	5·54	0·70	14·47	3·76	*tr.*	= 99·77

(*Zeitschr. geolog. Gesellsch.*, xii, 273, in Kopp's *Jahresbericht*, 1860, 776).

HORNBLENDE [p. 170, I–IV, VI–VIII].—Breithaupt has given the name *gamsigradite* to a black hornblende from Gamsigrad, in Servia. It has a vitreous lustre, velvet-black color, a greenish-gray streak, and is opaque. Cleavage, prismatic. H.=6. G.=3·12. Analysis by R. Müller (*B. and H. Zeitung*, xx, 53):

$\ddot{S}i$	$\dot{A}l$	$\dot{F}e$	$\dot{M}n$	$\dot{C}a$	$\dot{M}g$	$\dot{N}a$	$\dot{K}$	
46·58	13·63	12·29	6·00	8·83	8·44	3·17	1·00	= 99·94

[The large amount of manganese is quite remarkable; the oxygen ratio, as given by the author, for the bases and silica, is as 16·98 : 24·04 or 2 : 3. It is noteworthy that Rammelsberg, in his extended researches on hornblende, almost invariably found that a portion of the iron in the ferruginous-aluminous varieties was in the state of sesquioxyd.—G. J. B.]

ILMENITE [p. 115, V, VII].—Analysis of titanic iron, from Maxhofen, Bavaria, by J. Müller:

$\dot{T}i$	$\dot{F}e$	$\dot{M}n$	$\dot{A}l$	$\ddot{S}i$	$\dot{C}a$	
51·60	41·79[a]	4·00	1·57	0·90	0·30	= 100·166

[a] With *tr.* $\ddot{F}e$.

Occurs in irregular brittle nodules, of an iron-black color, black streak and sub-metallic lustre. H.=5. G.=4·692 (Kopp, *Jahresbericht*, 1859, 775).

IOLITE [p. 214, VII].—N. V. Kokscharow has found *iolite* at Mursinska, in the Ural, where it occurs in masses of the size of a walnut, associated with albite and andalusite. Color, reddish brown; translucent; lustre, vitreous to waxy. H.=7·5. G.=2·605. Chemical examination by Hermann: Heated in the closed tube gives water, and changes color from brown to light blue. B.B. fuses with difficulty to a white enamel. Composition:

$\ddot{S}i$	$\dot{A}l$	$\dot{F}e$	$\dot{M}n$	$\dot{M}g$	$\dot{L}i$	$\dot{H}$	
50·65	30·26	4·10	0·60	11·09	0·64	2·66	= 100·00

—*Mat. Min. Russlands*, iii, 253, *in Kopp's Jahresbericht*, 1860, 767.

IRITE [p. 103].—Claus considers that this mineral, described by Hermann as a compound of oxydized platinum metals with the oxyds of iron and chromium, is nothing more than a mechanical mixture of several substances. Aside from the improbability of obtaining a pure mineral by the washing of such a complicated mixture as the platinum-residue, Claus made a microscopical examination of the substance obtained by Hermann's method of separation, and found it to be a mixture of several substances, but consisting chiefly of iridosmine and chromic iron.—(*Jour. prakt. Chem.*, lxxx, 285.)

IRON [p. 17, II, VIII].—Boussingault has found traces of nitrogen in the meteoric iron of Lénarto (*Ann. de Chim. et de Phys.*, (3,) lxiii, 336.)

KÄMMERERITE [p. 291].—N. B. DeMarny has found *kämmererite* with chrome-iron in the district of Ufaleisk, in the Ural (*Bull. Soc. Nat., Moscou*, 1860, p. 200). The mineral occurs in imbedded crystals, which in their physical character, very much resemble the clinochlore from Achmatowsk. The crystals have a basic cleavage, and the prismatic faces are horizontally striated. The large crystals are sometimes an inch in diameter, and have a black color and vitreous lustre; the basic planes have a pearly lustre and violet color. The small crystals are transparent, and are of a carmine-red color. Sp. Gr. 2·731.

KEROLITE [p. 280].—Analysis of a bluish-white *kerolite*, from Harford County, Maryland, by F. A. Genth (this Journal, [2], xxxiii, 203):

	S̈i	Ḟe	Ṁg	Ḣ		
1.	51·20	0·22	26·81	undet.		
2.	51·09	0·23	28·28	20·91	=	100·51
3.	51·02	0·26	27·91	undet.		

KIESERITE.—*Reichardt, Das Salzbergwerk Stassfurth bei Magdeburg*, 1860, in Kopp's *Jahresbericht*. 1860, p. 788.—This name has been given by Reichardt to a salt from Stassfurth, in which he found Ṁg 21·66, S̈ 43·05, Ḣ 34·56=99·27; this gives the formula Ṁg S̈+3Ḣ. Subsequent analyses made by M. Siewert and B. Leopold differed from Reichardt's results, in containing two equivalents less of water.

The substance examined by Siewert consisted of two parts; one portion was opalescent, translucent and friable, while the other was of a darker yellow color, opaque and much harder than the first named. The first was not materially altered when heated at 100° C.; it dissolved in nitric acid, leaving a residue of 0·26 to 0·66 pr. ct., and contained a trace of chlorine; excluding these last as impurities, the composition is represented by analyses 1 and 2. The harder portion gave a residue of 1·5 pr. ct.; when treated with hot water, the residue consisted of sulphate and borate of magnesia. Leopold also found from 0·5 to 1·2 pr. ct. insoluble borates mixed with the specimens he examined.

	S̈	Ṁg	H	
1.	58·98	28·51	13·47	Siewert.
2.	58·90	28·61	———	"
3.	57·78	28·78	14·13	Leopold.

These give the formula Ṁg S̈+Ḣ.

KÖNLEINITE [p. 472, II].—According to Kenngott, the determinations of J. Fritzsche show that the *könleinite* from Redwitz has the same composition as his so-called hydro-carbon *retén*, $C_{36}H_{18}$, and that this species also occurs at Uznach. At the latter locality, könleinite is associated with *scheererite;* at Redwitz it is accompanied by *fichtelite*. It was questioned whether scheererite and fichtelite were identical, but this was not determined. The so-called *phylloretin* was also proved to be identical with *könleinite*.—(*Bull. Acad. St. Petersbourg*, iii, 88, Kenngott, *Uebersicht*, 1860, 116.)

LABRADORITE [p. 237, VII–IX].—For analyses of *labradorite*, from the black porphyry of Elbingerode and Rübeland, made in the Laboratory at Clausthal under the direction of A. Streng, see *B. and H. Zeitung*, xx, 265.

LANTHANOCERITE (*Hermann, J. pr. Chem.*, lxxxii, 406).—In a paper on cerite, Hermann asserts that two minerals have been known by this name. One, the true *cerite*, loses by ignition from 5 to 6 pr. ct., contains only a very little carbonic acid, and but 7 to 8 pr. ct. of the oxyds of lanthanum and didymium, while it contains from 56 to 64 pr. ct. of oxyd of cerium. The other mineral, which Hermann names *lanthanocerite*, loses 10 to 12 pr. ct. on ignition, contains 4 to 5 pr. ct. of carbonic acid and 34 pr. ct. of oxyds of lanthanum and didymium, and only 26 pr. ct. of oxyd of cerium. Hermann gives no physical characters to distinguish this new species, and quotes his former analyses (see Min., p. 812, Anal. 2, under Cerite,) with merely the additional determination of the relative amounts of the oxyds of lanthanum and didymium present, as follows:

S̈i	Ä̈l	Ċe	L̇a	Ḋi	Ṁn	Ḟe	Ċa	Ṁg	Ċ	Ḣ
16·06	1·68	26·55	16·33	18·05	0·27	3·17	3·56	1·25	4·62	8·10

with traces of cobalt and copper.

Hermann writes the formula: $4(\dot{R}^2\,\ddot{S}i+\dot{H})+(2\dot{R}_2\ddot{O}+3\dot{H})$.

It seems most probable that the mineral may be an altered substance, or, perhaps a mixture of cerite and lanthanite.

LAPIS-LAZULI [p. 229, VI, VII, IX].—Analysis of *lapis-lazuli*, from Ditro, in Siebenbürgen, by C. v. Hauer (Kenngott, *Uebersicht*, 1860, 54):

	$\ddot{S}i$	$\ddot{A}l$	$\ddot{F}e$	$\dot{C}a$	$\dot{N}a$	$\ddot{S}$
G. = 2·31	40·54	43·00	0·86	1·14	12·54[a]	1·92[b]

[a] By the difference. [b] Loss on ignition.

Found in a hornblendic vein in syenite, associated with pyrites and sphene.

LAZULITE [p. 404, II, VII].—E. J. Chapman has published an article on the *lazulite* from Graves' Mountain, Georgia, in which he endeavors to show that the form is trimetric instead of monoclinic (Canadian Journal, July and September, 1861). In his first article on the subject, Prof. Chapman erroneously considered the crystals as coming from Sinclair county in North Carolina, and he overlooked the fact that the crystals had already been figured by Prof. Dana in Prof. Shepard's article on lazulite in this Journal [2], xxvii, 36. The habit of the crystals and the modifications are monoclinic, and this evidence appears to outweigh that from measurements of crystals having so little lustre. It seems to be a case like datholite, which for a long time was thought to be trimetric, but is now known to be monoclinic.

LAUMONTITE [p. 307, IV–VI].—Analyses of altered *laumontite* from Lake Superior, by Lewinstein show that the crystals are partially converted into feldspar (orthoclase ?)—Kopp, *Jahresbericht*, 1860, 771.

LEPIDOLITE [p. 226, 508].—In connction with the discovery of the two new alkaline metals *cæsium* and *rubidium* by Bunsen and Kirchhoff, a new analysis of the Rozena *lepidolite* has been made in Bunsen's Laboratory by Cooper. To determine the rubidium with accuracy 13·509 grammes of lepidolite were used.

$\ddot{S}i$	$\ddot{A}l$	$\ddot{F}e$	$\dot{C}a$	$\dot{M}g$	$\dot{R}b$	$\dot{C}s$	$\dot{L}i$	LiFl	NaFl	KFl	$\dot{H}$	
50·32	28 54	0·73	1·01	0·51	0·24	*tr*	0·70	0·99	1·77	12·06	3·12	=99·99

The total amount of fluorine replacing oxygen is 5·48 per cent.—(*Jour. Prakt. Chem.*, lxxxv, 125.)

Messrs. O. D. Allen and J. M. Blake, of the Sheffield Laboratory, have examined the lepidolite from Hebron and Paris in Maine, and found it to contain very considerable quantities of cæsium and rubidium.

LEUCITE [p. 231, III, V, VI, IX].—Analysis of *leucite* from Vesuvian lava of 1858 by Rammelsberg:

$\ddot{S}i$	$\ddot{A}l$	$\dot{K}$	$\dot{N}a$	$\dot{C}a$		
57·24	22·96	18·61	0 93	0·91	=	100·65

—*Zeitschr. Geolog. Gesellsch.* xi, 496, *in Kopp's Jahresbericht*, 1860, 760.

LIEVRITE [p. 262, IV].—For an article by E. J. Chapman on the position of this species in the mineral series, see Canadian Journal for January, 1862.

LINARITE [p. 390.]—This rare mineral has been found by von Kobell among the lead ores from Vadainsk's Mine in the Nertschinsk District, Siberia, (*J. Pr. Chem.*, lxxxiii, 454). The mineral occurs in radiated clusters of small crystals of an azure-blue color. Measured with the microscope the cleavage angle was 103°. B.B., decrepitates, when slowly heated fuses in the flame of a candle. Analysis gave:

$\dot{P}b\ddot{S}$	$\dot{C}u$	$\dot{H}$ with tr. Cl		
76·41	17·43	6 16	=	100·00

Von Kobell remarks that the slight excess of sulphate of lead and water, was due to an admixture of earthy anglesite.

LOEWIGITE [*A. Mitscherlich J. pr. Chem.*, lxxxiii, 474].—This name has been given by Mitscherlich to the variety of *alunite*, analyzed by Löwig (Sup. V). It is found with *alunite*, at Tolfa in Hungary, as well as at Tabrze in Siberia. It contains the same constituents as *alunite* with the exception of nine instead of six

equivalents of water. This water is expelled at a lower heat than in the case of alunite, and the resultant compound instead of containing a mixture of soluble alum and insoluble alumina, consisted of a mixture of sulphate of potash with subsulphate of alumina. It is partially soluble in chlorhydric acid, while alunite is perfectly insoluble. Analyses:

	K̇	Ṅa	Ä̇l	F̈e	S̈	Ḣ	Ṁg	Ḃa	Ċa	S̈i	X(*a*)	Z(*b*)
Tabrze,	9·30	0·39	34·95	0·68	34·81	17·88	0·55	0·44	0·28	0·26	0·47	——
Tolfa,	7·17	——	26·29	——	27·63	12·04	3·21	——	0·07	——	——	23·59

a Organic substances. *b* Silicates.

Excluding the silicates in the Tolfa mineral, calculation gives K̇ 9·63, Ä̇l 36·01, S̈ 37·86, Ḣ 16·50. The formula K̇S̈+3Ä̇lS̈+9Ḣ=K̇ 10·66, Ä̇l 34·84, S̈ 36·18, Ḣ 18·32.

Margarite [p. 300, IV].—An analysis of so-called margarite from Pfitschthale near Sterzing, made by Oellacher is given in Kenngott's Uebersicht for 1860, p. 49, It differs entirely in composition from the true *margarite* as analyzed by Hermann, Smith and Brush. Composition:

	S̈i	Ä̇l	F̈e	Ċa	Ḃa	Ṡr	Ṁg	Ḟe	Ṁn	K̇	Ṅa	Ċu	Ḣ
G.=2·894	42·59	30·18	0·91	1·03	4·65	0·09	4·85	1·74	0·12	7·61	1·42	0·31	4·43

[A special examination for alkaline earths in the Sterzing margarite made under my direction by Mr. O. D. Allen, proves that it contains no baryta, and only a faint, unweighable trace of strontia. A solution of the alkaline earths from a gramme of the mineral gave, after long standing, a slight turbidity with sulphate of lime. The spectroscope showed the presence of strontia and lime, but not any trace of baryta. —G. J. B.]

Margarodite [p. 223, VIII].—A variety of mica from Derby, Vt., has been named *adamsite* by Prof. C. U. Shepard, on account of some supposed peculiar physical properties (*Hitchcock's Geology of Vermont*, vol. i, p. 484). It is found in thickly disseminated crystals in mica-slate, and Shepard remarks that "its crystalline form is that of mica and but for its perfect inelasticity and greater hardness, it might coalesce with this species." [We do not understand exactly what is meant by "*this species*," as every one knows that there are several species of mica. The specimens of mineral from Derby, Vermont, received from Prof. Shepard, and examined by the writer, have the same hardness, lustre, elasticity, cleavage, specific-gravity, blowpipe characters and chemical composition as margarodite. Analysis gave,

S̈i	Ä̇l F̈e	Ċa	Ṁg	Alkalies.	Ign.
47·76	36·29	0·24	1·85	8·77*a*	5·09 = 100·00

a By difference.

This corresponds very closely with the analyses of margarodite from Monroe, Ct., by Smith and Brush. This identity, and the exact correspondence of its physical properties with margarodite from different localities, leave no doubt as to the propriety of classing the so-called adamsite with this kind of mica.—G. J. B.]

J. Apjohn describes (*Dub. Quar. Jour. Sci.*, i, 119) a new locality of *margarodite* at Ross-Hill, near Maum, Ireland. It has a curved, foliated structure, the laminae not being parallel in masses of any size, but intersecting at various angles. Color white, with tinge of yellowish-green: lustre pearly, sub-translucent. Hardness over 2. G.=2·802. Difficultly fusible. Composition:

S̈i	Ä̇l	F̈e	Ċa	Ṁg	K̇	Ṅa	Ḣ
46·42	37·92	0·46	0·67	0·17	9·63	1·54	4·40 = 101·21

Martite [p. 102, VII].—Dewalque has described an octahedral sesquioxyd of iron from Frassem near Arlon in Luxemburg. Occurs in regular octahedrons in sandstone. Color black; lustre generally dull; fracture earthy, showing no cleavage; streak brick red; sp. gr. 4·35; hardness 7·5. Composition F̈e, with 0·33 S̈i, 0·37 Ä̇l, and traces of Ċa and Ṁg with 0·2 S. The sulphur indicates it to be a product of the decomposition of pyrites.—(Kopp, *Jahresbericht*, 1860, 775.)

Mica.—For analyses of Black Mica from Canton (Ireland) granite by S. Haughton, see Quar. Jour. Geol. Soc. Dublin, viii, 160.

MILLERITE [p. 49, I].—F. A. Genth has given analyses of the *millerite* from Gap Mine, Lancaster county, Pennsylvania. (This Journal [2], xxxiii, 195.) It there occurs in coatings of a radiated structure of $\frac{1}{16}$ to $\frac{1}{4}$ of an inch in thickness or concentrically radiated semi-globular masses or tufts. It is frequently tarnished, and many pieces show a commencing alteration into copper-glance, they are dull, of a black color at the upper part of the tufts or little crystals, while the lower part has the brass yellow color and metallic lustre of millerite. Two analyses—No. 1, finest millerite—No. 2, partly altered millerite.

	S	Cu	Ni	Co	Fe	Insol.
1.	35·14	0·87	63·08	0·58	0·40	0·28=100·35
2.	33·60	4·63	59·96		1·32	0·54=100·05

MONAZITE [p. 402, V].—F. A. Genth mentions a crystal of this species from the gold washings of Todd's branch, Mecklenburgh county, N. C., associated with diamond, garnet and zircon. It is $\frac{1}{4}$ of an inch long, a little over $\frac{1}{8}$ wide and somewhat less than $\frac{1}{8}$ thick, of a yellowish brown color and shows distinctly the following planes: 1, 1*i*, *ii*, *I*, -1 and *ii*. The crystal being slightly waterworn has the edges somewhat rounded, by which some other planes may have been obliterated. G. at 12° C.=5·203. (This Journal [2], xxxiii, 204.)

NAGYAGITE [p. 65, VIII].—An analysis of *nagyagite* disseminated through a rock from Nagyag gave S. J. Kappel after excluding foreign matter,

S	Au	Fe	Se	Ag	Pb
8·56	12·75	15·11	1·66	1·82	60·10

Kopp, *Jahresbericht*, 1859, 770.

OPAL [p. 151, III, IV, VI].—A variety of *hydrophane* from the meerschaum mines near Thebes (Greece) analyzed by G. Tschermak gave,

	$\ddot{S}i$	$\dot{M}g$	$\dot{H}$
G.= 2·11 (at 0° C.)	85·8	4·9	9·4=100·1

Wien. Akad. Ber. xliii, 381.

ORTHOCLASE [p. 242, II, III, V–VIII]. — G. vom Rath gives in *Pogg. Ann.* cxiii, 425, measurements of crystals of *adularia* from Ruäras.

Analyses of feldspar from the granite of Canton, Ireland, by S. Haughton (Jour. Geol. Soc. Dublin, viii, 159).

$\ddot{S}i$	$\ddot{A}l$	$\ddot{F}e$	$\dot{C}a$	$\dot{M}g$	$\dot{K}$	$\dot{N}a$	Ign.
64·48	19·12	0·56	0·45	*tr.*	12·52	3·24	0·16=100·53

PHOLERITE [p. 251, VIII, IX].—Analysis of *pholerite* from Lodève, Dept. Herault (France), by F. Pisani (*Comptes Rendus*, liii, 1072),

$\ddot{S}i$	$\ddot{A}l$	$\dot{H}$
47·0	39·4	14·4=100·8

giving the formula $\ddot{A}l^3\ddot{S}i^4+6\dot{H}$

PINITE [p. 45].—A. Streng has communicated an analysis of a mineral which he supposes to be identical with Knop's pinitoid (anal. 1). It occurs at Auerberg. No physical characters are given except the specific gravity, 2·75. Streng also gives an analysis of *pinite* (anal. 2) from Mühlenthal, near Elbingerode, where it is found in greenish-gray twelve sided lustreless prisms of a hardness of 2–3. The crystals are often covered with a thin brownish crust. G.= 2·62.—(*B. & H. Zeitung*, xx, 266).

A substance of similar composition from the porphyritic granite of Sasbachwald by Sandberger (anal. 3), by whom it was considered a product of the decomposition of oligoclase (Kenngott, *Uebersicht*, 1860, 39).

	$\ddot{S}i$	$\ddot{A}l$	$\ddot{F}e$	$\dot{C}a$	$\dot{M}g$	$\dot{K}$	$\dot{N}a$	Ign		
1.	50·95	30·62	2·48	0·35	0·35	9·74	0·12	5·25	=	99·86
2.	47·51	31·17	1·85	1·24	1·55	7·23	0·15	9·02	=	99·72
3.	50·43	28·89		——	3·45	5·12	3·68	5·84	=	97·44

For Nessler's analysis of *oosite*, a pinite-like substance from Oosthal near Baden, see Kenngott's *Uebersicht*, 1860, 42.

PLATINUM [p. 12, II, III, VI, VIII].—B. Cotta has observed *platinum*, associated with chrome-iron, in what appeared to be a yellowish-serpentine, from the gold district of Nischne-Tagilsk (Kopp, *Jahresberichi*, 1860, 743).

POLYBASITE [p. 85].—Analysis of polybasite, from Przibram, in Bohemia, by Tonner:

	Ag	Cu	Fe	Sb	S		
G.=6·03	68·55	3·36	0·14	11·53	15·55	=	99·13

Lotos, 1859, 85, in *Jahrb. Min.*, 1860, 716.

PREHNITE [p. 314].—Nöggerath describes the occurrence of prehnite, associated with fluor-spar, from Fassathal, in Tyrol (*Sitzungsberichte der niederrheinischen Gesell., Bonn*, vii, 8).

PROUSTITE [p. 78, IX].—Dr. Genth has discovered microscopic crystals of *proustite*, associated with native silver, at the McMakin Mine, Cabarras Co., North Carolina, [this Journal, [2], xxxiii, 195).

PSILOMELANE [p. 135].—Analysis of *psilomelane*, from Loeh Mine, near Olpe, by K. List:

	Ṁn Mn̈	O	Ċu	Ċo	Ċa	K̇	Ḣ	Insol.
G.=4·699	85·17	4·49	1·28	0·31	0·37	1·36	4·02	2·51

List gives the formula, $\dot{M}n^2$, $\dot{M}n^2+\dot{H}$. The mineral examined was remarkably pure. —(*Jour. prakt. Chem.*, lxxxiv, 60).

PYROPE [p. 194].—F. A. Genth has analyzed the *pyrope* from near Sante Fé, New Mexico. It has a deep blood-red, sometimes brownish-red color, and forms small somewhat angular grains, from $\frac{1}{8}$ to $\frac{1}{4}$ inches in diameter. G.=3·738. Composition:

S̈i	Ä̇l	C̈r	Ḟe	Ṁn	Ċa	Ṁg	Ign.		
42·11	19·35	2 62	14·87	0·36	5·23	14 01	0·45	=	99·00

Considering the chrome as sesquioxyd, and the iron as protoxyd, the oxygen ratio for S̈i, R̈, Ṙ, is as 20·86 : 9·85 : 9·47, or very nearly 2 : 1 : 1=$\dot{R}^3$ S̈i+R̈ S̈i, the formula of garnet—(this Journal, [2], xxxiii, 196).

PYROSMALITE [p. 310.—This rare species has been reëxamined by J. Lang (*Jour. prakt. Chem.*, lxxxiii, 424]. It is only found at the mines near Philipstedt, in Wermland, and occurs there in hexagonal prisms, of sometimes an inch in length, imbedded in calcite. Color, blackish-green to liver-brown. H.=4 5. G =3·168-3·174. Decomposed by both nitric and chlorhydric acid. The mean of all the determinations, including two complete analyses, gave:

S̈i	Ḟe	Ṁn	Ä̇l	Ċa	Cl	H
35·43	30·72	20·51	0·24	0·74	3·79	7·75

A special determination showed that only 0·79 of the iron was sesquioxyd; this small amount was thought to be due to a slight alteration of the mineral, or, perhaps, from an error in titration. Lang considers, therefore, that the mineral consists of protochlorid of iron, and a silicate of protoxyd of iron. The formula may be written 3Fe Cl+4 ($\dot{R}^3$ S̈i+2$\dot{R}^3$S̈i^2+6Ḣ).

PYROXENE [p. 158, I, II, V–IX].—Analysis of *pyroxene*, from the Vesuvian lava of 1858, gave Rammelsberg S̈i 49 61, Ä̇l 4·42, Ḟe 9·08, Ċa 22 83, Ṁg 14·22, F̈e undet.= 100·16.—Kopp, *Jahresbericht*, 1860, 758.

Des Cloizeaux has shown, by optical examination, that *enstatite*, *bronzite*, *hypersthene* and *wollastonite* are distinct from *pyroxene* in their crystalline form and optical properties (*Comptes Rendus*, lii, 786). For analysis of a pyroxene pseudomorph, by Pisani, see *Comptes Rendus*, liv, 51.

PYROPHYLLITE [p. 303, I, V, VI, VII].—In an examination of different varieties of Chinese figure-stone (pagodite) made in 1858, I found a compact variety of pyrophyllite, which seemed to bear the same relation to ordinary pyrophyllite as steatite does to talc. In chemical composition it was identical with the radiated mineral, but it differed in hardness and pyrognostic characters. Since the publication of this result, I have examined a large number of so-called steatites, and have found among

them many specimens of this compact pyrophyllite. Among these specimens is a so called soapstone, from Deep River, Moore Co., North Carolina. It has a schistose, or imperfectly lamellar structure, resembling talcose-slate. Laminæ, not sufficiently distinct to be separable; brittle. Color, greenish to yellowish-white. Cleavage very distinct, resembling talcose slate. H.=1·5. Sp. gr. 2·92. Before the blowpipe, in the closed tube, yields water; in the platinum forceps exfoliates slightly, and by prolonged heating, fuses with difficulty on the thin edges. With cobalt solution gives a reaction for alumina.

I received a second specimen, of a similar character, from Dr. F. A. Genth, who has kindly furnished me with several interesting steatitic minerals for examination. Dr. Genth informs me that it was found at Carbonton, Moore Co., North Carolina. It is more distinctly laminated than the specimen from Deep River, and was somewhat whiter in color, and had a density of 2·82.

These minerals have been analyzed, under my direction, in the Sheffield Laboratory of Yale College. No. 1, by Mr. Samuel T. Tyson; No. 2, by Mr. Oscar D. Allen:

	$\dot{S}i$	$\dot{A}l$	$\dot{F}e$	$\dot{H}$	
1. Deep River,	65·93	29·54		5·40	Tyson.
2. Carbonton,	66·25	27·91	1·08	5·25	Allen.

The composition is the same as that of the radiated and compact pyrophyllite, and this new and interesting variety is intermediate between the two extremes of structure. It furnishes additional evidence that the peculiar pyrognostic characters of the lamellar-radiated variety are due entirely to the structure of the mineral. My attention was first called to this substance by Mr. George Munger, of the firm of Dean & Munger, of this city, who have brought it into use extensively in the form of pencils for writing on slates and blackboards, for which purpose it is exceedingly well adapted.

Quartz [p. 145, II, III, IV, VII, VIII].—Rammelsberg has published an interesting series of experiments on the action of caustic potash on different varieties of silicic acid (*Pogg. Ann.*, cxii, 177). He confirms the observation of Fuchs and Rose, that caustic potash very perceptibly attacks quartz, and shows the impossibility of determining the relative amount of amorphous silica in hornstone, agate, chrysoprase, etc., by this means. These minerals consist chiefly of quartz, as H. Rose has already determined; their density, which is generally near 2·6, favors this conclusion. They always contain water, and their density is thereby lessened. Some varieties of chalcedony are dissolved to a great extent in caustic potash, but their specific gravity proves that the quantity of amorphous acid which they contain is much less than that indicated by the amount taken up by the potash solution. A specimen of chalcedony, from Hungary, with a density of 2·567, left, on repeated treatment with potash, a residue which amounted to only 6·12 per cent of the original substance. Opals also were found to differ very much in their solubility; many varieties appeared to contain quartz.

To ascertain the relative amount of quartz and amorphous silicic acid in these substances, Rammelsberg proposes to follow out the suggestion of Fuchs, who showed that when either powdered opal, or artificially prepared silicic acid, were mingled with caustic lime and water, they harden after some months into a sort of cement, which contains a silicate that gelatinizes with acids. Quartz is entirely without action on the lime when thus treated. Rammelsberg also remarks, that the optical properties of these minerals, although of great interest, do not offer a solution of the chemical side of the question.

G. Rose has observed crystallized quartz in the metallic iron of Xiquipilco, in Mexico. The crystal examined was $\frac{1}{3}$ of a line in diameter (*Pogg. Ann.*, cxiii, 184).

Rastolyte.—See Chlorite.

Rhodonite [p. 167, III].—Analysis of rhodonite, from Shäbenholz, near Elbingerode, by H. Hahn:

$\dot{S}i$	$\dot{M}n$	$\dot{C}a$	$\dot{M}g$	$\dot{F}e$	$\dot{A}l$	FeS_2	$\dot{H}$
44·86	42·98	3·06	6·15	1·52	0·74	0·40	0·95=100·65

B. and H. Zeitung, xx, 267.

ROESSLERITE [*R. Blum. Jahresber. d. Wetterauer Gesellsch.*, 1861, 32].—This name has been given by Blum to a new hydrous arseniate of magnesia, from the Kupfershiefer of Bieber. It is found in thin crystalline plates, with a columnar to fibrous structure, and sometimes in vermiform efflorescences. Cleavage, distinct in one direction. H.=2-3. Translucent to opaque; lustre, vitreous to dull. The translucent mineral on exposure loses its vitreous lustre, becomes opaque, dull and white. B.B. fuses to a white enamel, and in the closed tube gives water. Soluble in chlorhydric acid. Analysis by Delffs:

	Ṁg	Ä̇s	Ḣ
	14·22	40·16	45.62
Oxygen,	5·69	13·97	40 55

giving the formula $\dot{M}g^2\,\ddot{A}s+15\dot{H}=\dot{M}g$ 13·80, $\ddot{A}s$ 39.65, $\dot{H}$ 46·55=100·00.—*Jahrb. Min.*, 1861, 334.

SCHEELITE [p. 347, VIII].—Analysis of a very pure variety from Traversella, by Bernouilli, gave,

$\dddot{W}$	$\dot{C}a$		
80·70	19·25	=	99·95

Taking the equivalent of tungsten at 93·4, the formula $\dot{C}a\,\dddot{W}$ requires $\dddot{W}$ 80·74, $\dot{C}a$ 19·26.—(*Pogg. Ann.*, cxi, 607, in Kenngott's *Uebersicht*, 1860, 31.)

SERPENTINE [p. 282, I-IX]—Analysis of *serpentine*, resulting from the alteration of chrysolite, from Webster, North Carolina, gave Genth:

S̈i	Ä̇l	Ḟe	Ṁg	Ṁn	Ṅi	Ċa	Chrome-iron.	Ign.	
43·87	0·31	7·17	38·62	*tr.*	0·27	0·02	0·57	9·55	= 100·88

Dr. Genth remarks, that in the change of chrysolite into talc or serpentine, a portion of the magnesia is eliminated, which separates as brucite, hydromagnesite, magnesite, or dolomite, minerals which occur more or less at the principal serpentine localities. For further observations on *serpentine*, see Dr. Genth's paper in this Journal, [2], xxxiii, 201-203.

G. Servinstein has analyzed a serpentine pseudomorph of phlogopite from Somerville, New York (*Zeitschrift für Chemie und Pharmacie*, 1860, iii, 15).

Sexangulite.—See GALENA.

Spiautrite.—See WURTZITE.

SPINEL [p. 103, II].—F. A. Genth has analyzed the *automolite* from the Canton Mine, Georgia. The crystals are of a deep leek-green color, and a vitreous lustre, and present octahedral, and dodecahedral planes, the latter deeply striated. Composition:

S̈i	Ċu	Ä̇l	F̈e	Ḟe	Żn	Ṁn	Ṁg		
2·37	1·23	53·37	6 68	3·01	30·27	0·20	3·22	=	100·35

(This Journal, [2], xxxiii, 196.)

Stassfurthite.—See BORACITE.

STAUROTIDE [p. 261, III].—This species has been subjected to a critical reëxamination by Rammelsberg (*Pogg. Ann.*, cxiii, 599). He finds that all the varieties examined contain protoxyd of iron, and that most of the iron is in this state; some varieties contained no sesquioxyd, while others contained from 0·88 to 5·21 pr. ct. F̈e, and from 10·45 to 13·32 Ḟe. The silica varied from 28 86 to 51·32 pr. ct., and the alumina from 34·30 to 49·19. Specimens from the same locality varied materially in composition. The following varieties were examined:—I. From Massachusetts; occurs in black and brownish-black crystals, rhombic prisms of 129° 44′, with replacement of the acute edges and terminal plane on the obtuse edges, associated with black-mica and albite. The magnet extracted from the powdered mineral a small amount of magnetite. Fragments were translucent-brown, and the powder, yellowish-brown color. Sp. gr.=3·772.—II. St. Gotthardt. This is the well-known variety of brown staurotide, associated with kyanite and a compact variety of mica, which Schafhäutl has called *parogonite*, and which, according to Rammelsberg, is possibly identical with margarodite or damourite. Rammelsberg

remarks that the exact locality of this variety, as well as that under VII, is uncertain. The locality, St. Gotthardt, has been misapplied to this, as also to other minerals, some of which come from portions of Switzerland, very distant from St. Gotthardt; but as the exact locality is doubtful, R. still calls it by this name. Sp. gr. 3·744 (Jacobson).—III. St. Gotthardt. This, although associated with kyanite in a similar manner to the last, has a very different composition. The staurotide crystals frequently enclosed thin blades of kyanite, so that great care was required to obtain pure mineral.—IV. Franconia, New Hampshire. Large crystals, enclosing garnets; color, brown on the edges. G.=3·764.—V. Goldenstein, in Moravia. Brown crystals, in a reddish-brown mica-slate, associated with white or red quartz, with single small garnets. The staurotide resembles the St. Gotthardt variety in translucency, but the crystals are often covered externally with mica. Streak, yellowish brown. G.=3·654-3·66.—VI. Litchfield, Connecticut. Black crystals in mica-slate; streak, brownish-gray. G.=3·622.—VII. Airolo. The same variety as analyzed by Jacobson. Black crystals in a gray mica-slate, associated with brown garnets. Color, in thin pieces, yellowish-gray; and although the magnet takes up nothing from the powdered mineral, still it does not appear to be entirely pure. G.= 3·66-3·73 (Jacobson).—VIII. Lisbon, New Hampshire. Pretty large yellowish-brown crystals in a gray mica-slate, with garnets of an amethystine tinge (this locality is known among American mineralogists as Mink-Pond.—G. J. B.). G.=3·413. —IX. Brittany. A twin crystal, with rounded edges. G.=3·527-3·529 (Jacobson). —X. Pitkäranta, Finland. Large crystals in gray mica-slate; the planes are usually covered with glistening scales of mica. Streak, yellowish-gray. G.=3·265.

The following are the results of the analyses:

			$\ddot{S}i$	$\ddot{A}l$	$\dot{F}e$	$\dot{F}e$	$\dot{M}n$	$\dot{M}g$	Ign.	
A.	1.	Massachusetts,	28·86	49·19	3·20	13·32	1·28	2·24	0·43=	98·52
	2.	Gotthardt,	29·60	48·53	4·25	11·50	0·96	3·12	0·76=	98·72
B.	3.	Gotthardt,	35·05	44·18	5·21	11·48	*tr.*	2·86	0·95=	99·73
	4.	Franconia,	35·36	48·67	2·27	13·05	*tr.*	2·19	0·27=	101·80
	5.	Goldenstein,	35·15	44·02	0·88	12·16	1·41	3·06	1·27=	97·95
	6.	Litchfield, Ct.,	36·92	42·92	1·85	12·80	0·70	2·93	1·00=	98·82
C.	7.	Airolo?	43·26	40·45	2·40	10·92	—·	2·09	0·45=	99·57
D.	8.	Lisbon, N. H.,	49·10	37·70	—·	10·69	*tr.*	1·64	0·68=	99·81
	9.	Brittany,	50·75	34·86	2·86	10·45	*tr.*	1·80	0·38=	101·10
	10.	Pitkäranta,	51·32	34·30	—·	11·01	0·42	2·32	0·59=	99·96

The oxygen ratios are as follows:

	$\dot{R}$: $\ddot{R}$: $\ddot{S}i$ or	$\dot{R},\ddot{R}$: $\ddot{S}i$		$\dot{R}$: $\ddot{R}$: $\ddot{S}i$ or	$\dot{R},\ddot{R}$: $\ddot{S}i$
1.	0·5 : 3 : 1·9	1·84 : 1	6.	0·6 : 3 : 2·8	1·3 : 1
2.	0·5 : 3 : 1·9	1·84 : 1	7.	0·5 : 3 : 3·5	1 : 1
3.	0·5 : 3 : 2·49	1·4 : 1	8.	0·5 : 3 : 4·4	0·8 : 1
4.	0·48 : 3 : 2·37	1·5 : 1	9.	0·5 : 3 : 4·5	0·8 : 1
5.	0·6 : 3 : 2·65	1·36 : 1	10.	0·65 : 3 : 5·0	0·73 : 1

Rammelsberg classifies these under four heads: (A,) including analyses 1, 2; (B,) 3, 4, 5, 6; (C,) 7; (D,) 8, 9, 10; and considers that the results show a relation between the different varieties similar to the isomorphous members of the feldspar group. The general formula may be written, $(\dot{R}, \ddot{R}^2)+\ddot{S}i^n$.

Dr. Genth has published, in his "Contributions to Mineralogy," a description and three analyses of the so-called staurotide, from Canton Mine, Geo., (this Journal, xxxiii, 198). It occurs in minute crystals, rarely of $\frac{1}{4}$ of an inch in length, of a yellowish-brown or cinnamon-brown color, apparently right rhombic prisms, similar to those of staurotide, with planes I and $i\bar{i}$. G. at 27° C.=3·792, associated with copper and lead ores. The mean result of three closely agreeing analyses was,

$\ddot{S}i$	$\ddot{T}i$	$\ddot{A}l$	$\dot{F}e$	$\dot{Z}n$	$\dot{M}n$	$\dot{M}g$	$\dot{C}u$	$\dot{A}g$	Ign.	
28·82	0·84	49·21	9·51	7·13	0·15	3·22	*tr.*		1·47	= 100·35

This, when compared with the above mentioned results of Rammelsberg, show this mineral to be an exceedingly interesting variety of staurotide, in which a portion of the protoxyd of iron is replaced by zinc.

SZAIBELYITE (*K. F. Peters, Ber. Wien. Akad.*, xliv, 143).—Peters has discovered an exceedingly interesting borate in a gray granular limestone from Werksthal

near Retzbanya, to which he gives the name *szaibelyite*. The structure of the limestone somewhat resembles a coral, showing on the fractured surface numerous light colored circular spots surrounded by a dark crust. The hardness of the interior of these spheroidal masses was such that it was scarcely scratched by steel, while the crust was nearly as soft as limestone. Treated with dilute acid, the mass of limestone was dissolved away, leaving numberless needle-like crystals, in some cases attached to the kernels in such a manner, that the author compares them to a pinball. Viewed under the microscope the crystals appeared to belong to either the monoclinic or triclinic systems. With Nicol's prisms, both the needles, and the kernels were biaxial. In these respects the mineral very much resembles *hayesine*. A chemical examination made by Preyss showed that a solution obtained by acting on the needles with strong chlorhydric acid, gave evidence of the presence of boracic acid and magnesia. A further examination made by Peters proved it to be hydrous borate of magnesia and soda with some chlorine, but containing neither lime or alumina. He calls attention to the remarkable analogy between it and hayesine, but suggests also that it may be classed nearer Volger's *parasite* or Rose's *stassfurthite*. If the soda is an unimportant constituent, it may possibly be identical with the latter mineral.

Talc [p. 275, V, IX].—A talc from Webster, Jackson Co., N. C., which Dr. Genth considers the result of the alteration of chrysolite, gave on analysis (this Journal, [2,] xxxiii, 200):

$\ddot{S}i$	$\dot{A}l$	$\dot{F}e$	$\dot{N}i$	$\dot{M}g$	$\dot{H}$	
64·44	0·48	1·39	0·23	33·19	0 34	= 100·07

The absence of water is remarkable.

Tetrahedrite [p. 82, I, II, V, IX].—Ch. Mène gives additional analyses of the so-called *fournetite* (Suppl. IX,) in the *Comptes Rendus*, lii, 311, 1,326; also a new locality of the mineral in the Val Godemar (Hautes-Alpes). According to Mène, this variety of gray copper resembles iron-pyrites, except that its color is steel-gray, with greenish reflections. It is amorphous and compact. Mean of three analyses of the Val Godemar mineral, after excluding from 4·7 to 10·10 pr. ct. of quartz:

	Cu	Pb	S	Fe	As	Sb	
G.=4·30	30 80	11·50	21·70	4·50	10 00	21·50	= 100·00

giving the formula $3Cu_2S+2Sb_2S_3+PbS+Fe_2As_3$, while that from Ardillats gave $3Cu_2S+3Sb_2S_3+PbS+FeAs$. Both varieties contained silver; that from Ardillats, 0·05 to 0·21 pr. ct., and from Val Godemar, 0·08 to 0·11 pr. ct.

Texalite.—See Brucite.

Topaz [p. 259, IV].—Analyses of *topaz*, by H. St. Claire Deville (*Comptes Rendus*, lii, 782):

	$\ddot{S}i$	$\dot{A}l$	Si	Fl	
1. Saxony,	22·3	54·3	6·5	17·3	= 100·4
2. Brazil,	25·1	53·8	5·8	15·7	= 100·4

Tritomite [p. 319, III].—F. P. Möller has analyzed this mineral in Prof. Bunsen's Laboratory, with following results. G.=4·26: $\ddot{S}i$ 15·38, $\dot{S}n$ 0·74, $\dot{T}a$ $\dot{Z}r$ 3·63, $\dot{C}e$ 4·48 $\dot{M}n$ 0·49, $\dot{F}e$ 2·27, $\dot{A}l$ 1·61, $\dot{C}e$ 10·66, $\dot{L}a$ $\dot{D}i$ 44·05, $\dot{Y}$ 0·42, $\dot{C}a$ 6·41, $\dot{B}a$ 0·19, $\dot{S}r$ 0·71 $\dot{M}g$ 0·16, $\dot{K}$ 2·10, $\dot{N}a$ 0 56, $\dot{H}$ 5·63=99·49

The 3·63 pr. ct. tantalic and zirconic acid was called so with a query, there having been something anomalous in its reactions. These results differ very materially from the earlier analyses by Berlin and Forbes, but great care seems to have been taken in obtaining accurate results, especially in the determination of the state of oxydation of the bases. Müller gives the formula $3\ddot{R}^4\ddot{S}i+\ddot{R}\ddot{S}i^3+6\dot{H}$.—*Ann. Chem. Pharm.*, cxx, 241.

Uranite [p. 430, IV.]—Des Cloizeaux has already shown, by optical examination, that *uranite* and *chalcolite* belong to different crystalline systems, uranite being trimetric, while chalcolite is dimetric. Pisani has now re-examined the chemical composition of these two minerals, and finds that the uranite of Autun, when air-

dried, has 12 atoms of water, the amount remaining constant even after months of exposure, while chalcolite, from Cornwall, has but 8 atoms. When uranite is heated to 70° C. it loses 4 atoms of water, but Pisani considers this as constitutional and not as hygroscopic water. Analyses gave,

	P	Ur	Ca	Cu	H	Sand.	
1. Uranite, Autun,	13·4	56·47	5·60	—	20·00	3·20	= 98·67
2. Chalcolite, Cornwall,	14·0	59·67	—	8·50	15·00	0·40	= 97·57

No. 1, excluding sand and calculating up to 100, gives P 14·0, Ur 59·0, Ca 5·8, H 21·2; No. 2, calculated in the same manner, equals P 14·4, Ur 61·5, Cu 8·6, H 15·5, giving the formula for uranite, $(Ca, Ur^2)P+12H$; for chalcolite, $(Ca, Ur^2)P+8H$, (*Comptes Rendus*, lii, 817).

Wagite.—See CALAMINE.

WHITNEYITE [VII, IX].—Dr. F. A. Genth has published additional analyses of this rare species (this Journal, xxxiii, 191). The specimen examined was furnished by Prof. Booth of the U.S. Mint, and was thought to be from the north shore of Lake Superior. On examination it proved to consist of two minerals, *whitneyite* and *algodonite*. The whitneyite is compact, with a fine grained structure, and a reddish to grayish white color, and no lustre on surfaces of fresh fracture. Scratching developes a strong metallic lustre, and a reddish-white color, but it soon tarnishes. G.=8·246-8·471, the variation probably due to porosity. Hardness a little less than that of fluor. Slightly malleable. Fracture sub-chonchoidal. Analysis:

	As	Cu	Ag	
1.	10·92*a*	87·64	0·19	= 98·75
2.	12·29	87·48	0·04	= 99·81
3.	12·28	87·37	0·03	= 99·68

a Too low.—F. A. G.

The specimen analyzed was not entirely free from algodonite, but gives very nearly the atomic composition, $Cu_{18}As$=As 11·64, Cu 88·36.

[While on a visit to Lake Superior, last summer, I learned from Mr. A. B. Wood that a loose mass of whitneyite, weighing about 15 lbs., had been found on the Pewabic location, about one mile from the village of Hancock, Portage Lake. A specimen of *whitneyite* mixed with *algodonite*, similar to that mentioned by Dr. Genth, is in the Yale College Cabinet, and was received some years since from Prof. Booth, who remarks on the label, that he broke it from a mass weighing 50 lbs. It thus seems that these arsenids of copper must occur in considerable abundance, and although thus far, they have not been found in place, we may hope that explorations will soon give us the exact locality.—G. J. B.]

WOLFRAM [p. 351, I–IV, VIII, IX].—Analyses of *wolfram*, by F. A. Bernouilli (*Pogg. Ann.* cxi, 603, in Kenngott's *Übersicht*, 1860, 93):

	W	Fe	Mn	Ca	Cb	
1. Chanteloupe,	75·68	18·77	5·01	0·22	—	= 99·68
2. "	75·75	18·08	5·75	—	0·31	= 99·89
3. Traversella,	75·99	16·29	3·45	4·03	—	= 99·76
4. Zinnwold,	75·15	9·72	13·99	*tr.*	1·10	= 99·96
5. "	76·20	5·60	17·94	—	—	= 99·74
6. "	75·08	18·51	5·02	—	0·52	= 100·03
7. "	76·13	18·49	5·10	—	—	= 99·72

Showing that the bases replace each other in all proportions, and that even from the same locality the composition of different specimens may vary.

WOLLASTONITE [p. 156, II].—Analysis of *wollastonite*, from the granular limestone at Auerbach, by W. Hampe:

Si	Ca	Fe	Al	
52·01	46·74	0·93	1·87	= 101·55

B. and H. Zeitung, xx, 267.

WURTZITE [*C. Friedel, Comptes Rendus*, lii, 983].—This new species is from a silver mine near Oruro, in Bolivia. It is a hexagonal sulphid of zinc, isomorphous with *greenockite*. The following are its characters: Color, brownish-black; lustre, vitreous; streak, brown. Before the blowpipe, and with reagents, gives the same reactions as blende. The crystals are double hexagonal pyramids, in some cases showing the faces of the hexagonal prism, which are striated parallel to the base. The angle between the prismatic and pyramidal planes could not be measured with accuracy, but the mean of several measurements gave about 129°; this is near that of the same angle in greenockite (127° 45′). Cleavage, both basic and prismatic. G.=3·98. H.=3·5—4. Composition:

S	Zn	Fe	Pb	Sb	Cu
32·6	55·6	8·0	2·7	0·2	*tr.* = 99·1

The lead and antimony are due to the gangue, the mineral being associated with sulph-antimonid of lead, and the slight excess of sulphur is owing to the presence of a small amount of pyrites, the presence of which was distinguished by a magnifier. The composition is essentially that of blende, while the hexagonal form proves that natural sulphid of zinc is dimorphous, a fact before established in regard to the artificially produced sulphid. It is named in honor of Adolph Wurtz, the distinguished French chemist.

Breithaupt has published in the *Berg und Hüttenmännische Zeitung*, xxi, 98, the fact that two years since he discovered that the radiated blende from Przibram was hexagonal, and he gave it in his lectures the name *spiautrite*. More recently he has found that the radiated blende from Albergaria Velha in Portugal is also hexagonal. —The name *wurtzite* has the priority in publication, and consequently will be used for the hexagonal form of sulphid of zinc.

YTTRO-TANTALITE [p. 359, IV, IX].—Analysis of amorphous brown *yttro-tantalite* from Kararfvet by Chydenius. Ta 56·44, Zn 0·42, Yt 30·43, Ca 2·27, Cu 0·27, Fe 3·27, U 1·19, H 4·83=99·12.—Kenngott's *Uebersicht*, 1860, 93.

ZINCITE [p. 110, II, III, IX].—The new synonym *Ruby-Zinc* has been proposed for this species by F. Alger.—*Proc. Boston Soc. Nat. Hist.*, viii, 145.

ZIRCON [p. 195, IV].—Kokscharow has found that the so-called *engelhardite* from Ilginsk is identical with zircon.—Kopp's *Jahresbericht*, 1860, 756.

NOTE.—As a new edition of the Mineralogy is now in course of preparation, this is the last Supplement which will be issued before its publication.

Sheffield Laboratory, Yale College, June 16th, 1862.