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

List of Works, etc.

F. X. M. ZIPPE: Lehrbuch der Mineralogie mit naturhistorischer Grundlage. pp. 450, 8vo, mit 334 Fig. Wien, 1860.

A. DESCLOIZEAUX: Sur l'emploi des propriétés optiques biréfringentes pour la détermination des espèces cristallisées. p. 88, 8vo. Extrait des Annales des Mines, tome xiv, 1858.

A. DELESSE: Etudes sur le Métamorphisme. Roches granitiques, pp. 77, 8vo. Extrait des Annales des Mines, tome xii.

CARL F. NAUMANN: Elemente der Mineralogie, fünfte vermehrte und verbesserte Auflage. 8vo, pp. 460, mit 483 Fig. Leipzig, 1859.

N. VON KOKSCHAROW: Materialen zur Mineralogie Russlands, dritter Band, Lieferung 1—3, pp. 128, mit Atlas. St. Petersburg, 1859.—This continuation of Koksharow's great work, contains monographs of the species garnet, magnetite, anal-

* In the absence of Professor Dana I have endeavored to give an abstract of the results of the mineralogical researches, published since the appearance of the seventh Supplement.—G. J. B.—New Haven, April 1, 1860.

cime and euclase, together with important additional notes upon beryl, cancrinite, nepheline, phenacite, and apatite.

ADAM: Extrait du Tableau Minéralogique. 8vo, pp. 14. Paris.

J. F. L. HAUSMANN: Ueber die Krystallformen des Cordierites von Bodenmais in Bayern. 4to. pp. 16. Göttingen, 1859.

GUSTAV ROSE: Ueber die heteromorphen Zustande der kohlensauren Kalkerde, zweite Abhandlung, mit drei Kupfertafeln. 4to. pp. 48. Berlin, 1859.

VICTOR VON LANG: Versuch einer Monographie des Bleivitriols. 8vo, pp. 54, mit xxvii Tafeln. Wien, 1859.

D. D. OWEN: *First Report of a Geological Reconnaissance of the Northern Counties of Arkansas.* Little Rock, 1858.—In this report Dr. Elderhorst has contributed much that is of interest in regard to the ores of zinc, lead and manganese, and presented his facts in a manner that will make them of permanent practical value.

H. KOPP und H. WILL: Jahresbericht über die Fortschritte der Chemie und verwandter Theile anderer Wissenschaften für 1858. Giessen, 1859. pp. 859.—Pages 673 to 812 contain Dr. Kopp's excellent review of the progress of mineralogical science for the year 1858.

H. C. SORBY: On the Microscopical Structure of Crystals, indicating the Origin of Minerals and Rocks. 8vo, pp. 48, with plates. Quart. Jour. Geol. Soc. Lond., xiv, pp. 458–500.

H. DAUBER: Ermittelung krystallographisher Constanten und des Grades ihrer Zuverlässigkeit. Pogg. Ann., cvii, 267, 343, cviii, 439.

W. H. MILLER: On the employment of the Gnomonic Projection of the Sphere in Crystallography. L., E. and D. Phil. Mag. for July, 1859.

DAUBRÉE: Memoire sur la relation des sources thermales de Plombières avec les filous métalifères, et sur la formation contemporaine des zéolithes. Extrait du Bulletin de la Société Géologique de France, [2], xvi, p. 562–591.

A. KENNGOTT: Uebersicht der Resultate mineralogischer Forschungen im Jahre, 1858. 8vo, pp. 229. Leipzig, 1860.—This is a continuation of Dr. Kenngott's excellent reports, and contains a résumé of the results of mineralogical researches made in 1858. Its completeness, and the careful criticisms by Dr. Kenngott render it a most valuable auxiliary in the study of mineralogy.

F. HESSENBERG: Mineralogische Notizen, No. 3. 4to, pp. 32. Frankfurt, 1860. —This number of Hessenberg's mineralogical notices, contains contributions to the crystallography of the species lievrite, realgar, heavy-spar, calcite, sphene, anatase, crocoisite, and malachite.

*Descriptions of Species.**

ALBITE [p. 240, VI].—Analyses of albite, (1.) from Oberhalbstein in Graubunden by Desclabissac (Zeitsch. d. deutschen geolog. Gesell., x, 207). (2.) from Calveras County, California, associated with auriferous pyrites and native gold by F. A. Genth (this Journal, [2], xxvii, 249):

	$\ddot{S}i$	$\dot{A}l$	$\dot{F}e$	$\dot{C}a$	$\dot{M}g$	$\dot{N}a$	$\dot{K}$	ign.	
1.	68·50	18·11	——	0·56	0·66	12·17			=100·00
2.	68·39	19·65	0·41	0·47	——	10·97	*tr.*	0·21	=100·10

ALLANITE [p. 208, I—VI].—Analyses of *orthite* (1.) from Arendal by Zettel (Ann. d. Chem. u. Pharm., cxii, 85). (2.) mean of four analyses of orthite from Suontaka in Finland by Mendeljef (Kopp's Jahresbericht, 1858, 703):

	$\ddot{S}i$	$\dot{A}l$	$\dot{F}e$	$\dot{M}n$	$\dot{C}e$	$\dot{L}a, \dot{D}i$	$\dot{C}a$	$\dot{M}g$	$\dot{K}$	$\dot{N}a$	$\dot{H}$	$\dot{C}$	
1.	32·70	17·44	16·26	0·34	3·92	15·41	11·24	0·90	0·51	0·24	2·47	0·28	=101·71
2.	48·0	2·4	34·8	——	3·3	ẏ 1·5	9·3	——	——	——	0·7	——	=100·00

* The paging refers to Dana's Mineralogy, and the Roman numerals, in many places added, to the preceding Supplements.

ANORTHITE [p. 234, II, VI].—Potyka (Pogg. Ann., cviii, 110) has found *anorthite* to be a constituent of the rock occurring associated with hornblende at the Konchekowskoi Kamen in the Urals. The sp. gr. in fragments was 2·731 (17·1° C.), in powder 2·7325 (16·8°). B.B. difficultly fusible. Only partially decomposed, and with gelatinization, by chlorhydric acid.

Si	Al	Fe	Ca	Mg	K	Na	
45·31	34·53	0·71	16·85	0·11	0·91	2·59	= 101·01

corresponding very closely with the formula $Ca^3Si+3AlSi$, or considering silica as SiO_2=CaSi+AlSi.

Anorthite from Carlingford, Ireland, gave on analysis by Prof. Haughton, Si 45·87, Al 34·73, Ca 17·10, Mg 1·55=99·25 (Greg, L., E. and D. Phil. Mag., [4], xix, 13).

ANTIGORITE [p. 281, I, IV].—For description of optical properties of, see Haidinger's article in Pogg. Ann., lxxvii, 94, and Descloizeaux, Ann. des Mines, xiv, (1858.)

APATITE [p. 396, I—VII].—A description of crystallized *apatite* from Pfitsch-Thal in Tyrol is given by G. vom Rath.—Pogg. Ann., cviii, 353.

ATACAMITE [p. 138, I, III, IV, V].—Bibra gives for the composition of *atacamite* from Algodan Bay in Bolivia:

Cu	Cu	Cl	H	Si	
56·00	14·54	16·11	12·13	0·91	= 99·60

—Kopp's Jahresbericht, 1858, 740.

ARAGONITE [p. 448, II, III, IV, V, VII].—Luca has described a variety of aragonite, occurring in the Lias of Gerfalco in Tuscany, which he calls *mossottite*. The mineral is a prismatic fibrous radiated aggregate of a light green color. Sp. gr.= 2·884. On heating crumbles and loses its color. Composition:

Ca	Sr	C	Cu	Fe	Fl	H	
50·08	4·69	41·43	0·95	0·82	*tr.*	1·36	= 99·33

According to Marcel de Serres, the same variety of aragonite occurs in the province of Messima.—(Kopp's Jahresbericht, 1858, 732.)

A variety of aragonite from Nertschinsk has been named *oserskite* by Breithaupt (B. and H. Zeit., xvii, 54).

AXINITE [p. 213].—This species has been observed at Cold Spring in New York.

BISMUTH [p. 20].—A specimen of *native bismuth*, associated with native gold, from the Peak of Sorato, analyzed by F. A. Genth (this Jour., [2], xxvii, 247) contained:

Bi	Te	Fe	
99·914	0·042	*tr.*	= 99·956

BORACITE [p. 393, II, III, IV].—The identity in chemical composition of *boracite* and *stassfurthite* was shown by Chandler (Suppl. IV), and is further confirmed by the analyses of Siewert and Drenkmann (Zeitschrift f. d. ges. Naturwissen, xi, 365, in Kopp's Jahresbericht, 1858, 735). The direct determinations made on the washed and ignited mineral in seven partial analyses gave as the mean:

Mg	Fe	B	
30·83	0·32	69·05	= 100·20

But H. Ludwig found (Arch. Pharm., [2], xcvi, 129, in Kopp's Jahresbericht, 1858, 735) that the unwashed air-dried stassfurthite contained

MgCl	Mg	B*a*	H
11·75	23·80	58·45	6·00

(*a*) By the difference.

A direct determination of B gave 59·72 p. c., and Ludwig considered it a hydrous boracite containing a variable mixture of chlorid of magnesium. Heintz, however, has shown that chlorid of magnesium is an essential constituent of the mineral and that even after long washing with hot water it still contains a considerable amount of this chlorid. His results (calculated from five partial analyses) gave (Jour. f. prakt. Chem., lxxvi, 243):

Cl	Mg	$\dot{M}g$	$\dot{F}e$	$\ddot{B}$	$\dot{H}$		
8·14	2·84	25·74	0·43	61·22[a]	1·63	=	100

a By the difference.

from which he draws the formula $2(\dot{M}g^6\ddot{B}^4)+MgCl, \dot{H}$. In communicating these observations of Heintz to the Berlin Academy, H. Rose (loc. cit.) adds that the boracite from Lüneberg also contains chlorine as an essential constituent, and this has been substantiated by the recent analyses of Dr. Julius Potyka (Pogg. Ann., cvii, 433), and also by Heintz (Jour. f. prakt. Chem., lxxvii, 338).

Potyka analyzed both boracite and stassfurthite, and four analyses of boracite are given by Heintz, having been made under his direction by Siewert and Geist. The results are as follows:

	MgCl	$\dot{M}g$	$\dot{F}e$	$\ddot{B}$	$\dot{H}$	
1. Clear boracite crystals,	10·90	25·24	1·59	62·91	0·55=101·19	Potyka.
2. Clouded " "	10·41	26·19	1·66	61·19	0·94=100·39	"
3. Stassfurthite,	10·73	26·15	0·40	60·77[a]	1·95=100·00	"
4. Boracite,	11·14	26·00	1·52	61·34[a]	—=100·00	Siewert.
5. "	11·71	24·86	1·13	62·30[a]	—=100 00	"
6. "	11·11	25·45	1·83	61·61[a]	—=100·00	Geist.
7. "	11·54	25·43	1·05	61·98[a]	—=100·00	"

a. By the difference.

Potyka's specimens, after pulverization, were washed with cold water until the wash water no longer gave any reaction with nitrate of silver or chlorid of barium; he found that both boracite and stassfurthite were slightly soluble in hot water. All the specimens of boracite were from Lüneberg. Heintz was unable to find a weighable quantity of water. Both Potyka and Heintz express the composition of boracite by the formula $2(\dot{M}g^3\ddot{B}^4)+MgCl=\ddot{B}$ 62·50, $\dot{M}g$ 26·86, MgCl 10·64=100. Stassfurthite appears to be a boracite with one atom of water, $2(\dot{M}g^3\ddot{B}^4)+MgCl, \dot{H}$ $=\ddot{B}$ 61·27, $\dot{M}g$ 26·33, MgCl 10·42, $\dot{H}$ 1·98=100.

Bromyrite [p. 93].—F. Field has analyzed the *bromyrite* which occurs in octahedrons imbedded in carbonate of lime at Chañarcillo in Chile (Quar. Jour. Chem. Soc., x, 241). The crystals had the color and lustre of amber, and are much harder than the chloro-bromids or chlorid, and appear to be little affected by light. Composition,

Ag	Br		
57·43	42·57	=	Ag Br

Cancrinite [p. 233, II].—P. v. Pusirewsky has analyzed the *cancrinite* from the Ilmen Mts. and from Mariinskaja in the Tunkinsk Mts. (Koksharow, Mat. Min. Russlands, iii, 76):

	$\ddot{S}i$	$\ddot{A}l$	$\dot{F}e$	$\dot{N}a$	$\dot{C}a$	$\ddot{C}$	$\dot{H}$	$\ddot{S}$	
1. Ilmen Mts.,	35·71	29·58	—	18·78	5·56	5·56	3·76	0·32	=99·27
2. " "	36·21	29·56	0·19	18·27	5·81	5·54	3·64	——	=99·22
3. Tunkinsk Mts.,	37·72	27·75	—	21·60	3·11	5·61	4·07	——	=99·86

The variety from the Ilmen Mts. had a light rose-red color and sp. gr.=2·489. That from Mariinskaja was yellow, sp. gr.=2·454. Pusirewsky writes the formula $2(\dot{N}a^2\ddot{S}i+2\ddot{A}l\ddot{S}i+[\dot{N}a, \dot{C}a]\ddot{C})+3\dot{H}$, containing one atom more of water than the formula given by Whitney for the cancrinite of Litchfield, Maine.

Carnallite [III].—Heintz gives the composition of *carnallite*, as found by Siewert:

$\dot{M}gCl$	KCl	NaCl	$\dot{C}a\ddot{S}$	$\dot{H}$
36·03	27·41	0·23	1·14	36·33—38·01

—Kopp's Jahresbericht, 1858, 739.

Cassiterite [p. 118, V, VI, VII].—In a recent letter (Boston, Jan. 8th, 1860) to Prof. B. Silliman, Jr., Dr. C. T. Jackson mentions having received from Los Angelos in California a so-called silver ore, which on examination proved to be oxyd of tin mixed with some peroxyd of iron. On assay it gave 60·5 per cent of metallic tin. From the size of the masses of ore, Dr. Jackson is led to suppose that a vein of workable magnitude exists, some specimens being eight inches in thickness.

CERITE [p. 312].—Rammelsberg (Pogg., cvii, 632) has published several analyses of this species. The mean of the results gives—

Si	Ce	La, Di	Ca	Fe	H
19·18	64·55	7·28	1·35	1·54	5·71=99·61

from which he draws the formula $(Ce, La, Di, Ca, Fe)^2Si+Aq$, or R^3Si+Aq. An important fact observed by Rammelsberg is, that when cerite is treated with chlorhydric acid it is partially decomposed, leaving an insoluble residue of a different composition from that contained in the solution. He remarks that it appears as if cerite was composed of a mixture of silicates, differing in not being equally acted upon by acids.

CINNABAR [p. 48, II, IV, V].—Hugo Müller has analyzed and described tetrahedral crystals of cinnabar, from Asturia, Spain, which he supposes to be pseudomorphs of either tetrahedrite or chalcopyrite.—Quar. Jour. Chem. Soc., xi, 240.

CHLORITE [p. 294, IV, V].—For analyses of a chlorite-like substance from the melaphyr-porphyry of Ilfeld by Streng, see Zeitschrift d. deutschen geolog. Gesellschaft, x, 136.

CHRYSOCOLLA [p. 309, II].—P. Herter gives analyses of two varieties of chrysocolla from the crystalline slates of Ober and Nieder-Rochlitz in Transylvania, in Zeitsch. d. deutschen geolog. Gesellschaft, ix, 372. In the same paper Herter mentions a mineral which he considers a new species. It occurs in a geode of quartz. It is amorphous; brittle; color dark pistachio-green to liver-brown and dirty yellowish-green; has a strong pitchy lustre and an almost conchoidal fracture. Sp. gr.= 2·991. Contains Si 14·24, SbO_5 24·68, As 7·24, Cu 31·49, Pb 0·68, Ag 2·05, Fe 8·38, Ca 2·16, Mg 0·56, Al 0·21, H 8·03=99·71. Another specimen gave but 16 per cent copper, showing the composition to be variable. In matrass gives water. Fuses easily in the forceps coloring the flame emerald green, with soda on charcoal gives a metallic bead. The centre of several of the masses was found to contain tetrahedrite, of which the above substance is a product of decomposition.

CLAYITE, *W. J. Taylor* (Proc. Acad. Nat. Sci., Philad., Nov. 1859.).—This mineral is a sulphid of lead, with about twenty-five per cent of arsenic, copper and antimony, and appears to be intermediary between galena and cupro-plumbite. It is from Peru, and occurs in small monometric crystals, a combination of the tetrahedron with the dodecahedron. It is also found amorphous, forming a coating a thirty-second of an inch thick on a layer of quartz. Color and streak blackish-gray; sectile; hardness about 2·5. B.B. on charcoal fuses easily, giving reactions for lead, arsenic and antimony, and with soda a brilliant metallic globule which becomes lustreless on cooling. Carefully selected crystals gave—

	S	As	Sb	Pb	Cu	Ag
1.	8·22	9·78	6·54	68·51	7·67	*tr.*
2.	8·14	——	——	67·40	5·62	——

No. 2 was not entirely free from extraneous matters. Prof. Taylor gives the formula (Pb, Cu)(S, As, Sb). A confirmatory result was obtained on a specimen of the amorphous variety. The mineral was received from Joseph A. Clay, Esq., of Philadelphia, having been sent to him by his brother, Hon. J. Randolph Clay, United States Minister in Peru, and it is named in honor of these gentlemen. [The amount of sulphur is extremely small, and the presence of arsenic and antimony seems to indicate an analogy with *steinmannite*, which has recently been shown to be a galena, containing some twenty or more per cent of the sulphids of arsenic, antimony and zinc, although this composition varies exceedingly.—G. J. B.]

COAL [p. 26, II, IV, VI].—O. Matter has analyzed (Jour. f. prakt. Chem., lxxvii, 39) the so-called Bog-head coal from Torbane-Hill in Scotland, with the following result:

C	H	N	O	S	H	Si	Al	Fe	Ca
60·81	9·18	0·78	4·39	0·32	0·39	13·19	9·50	1·22	0·27=100·05

CONDURRITE [p. 36, V].—An examination of this mineral by C. Winkler (B. u. H. Zeit., xviii, 383) confirms the results obtained by v. Kobell and Rammels-

berg, showing this mineral to be a mixture of arsenolite, cuprite, copper-glance, and arsenid of copper.

COPPERAS [p. 380].—A cupriferous variety of copperas from a mine of chalcopyrite in Turkey has been analyzed by Pisani (Comptes Rendus, April 18, 1859). Color like that of cyanosite, on exposure assumes an ochreous tint. Composition—

Ċu	Ḟe	S̈	Ḣ
15·56	10·98	29·90	43·56

giving the formula (Ḟe Ċu)S̈+7Ḣ, or copperas in which a portion of the iron is replaced by copper.—(L. E. and D. Phil. Mag., [4], xvii, 409.)

COPPER NICKEL [p. 52, VI].—According to G. Rose and Nöggerath the copper-nickel from Sangerhausen crystallizes in the hexagonal form.—(Zeitschrift d. deutschen geolog. Gesellsch., x, 91; Verhandl. d. naturhist. Ver d. Rheinlande, xv, xv.)

CYANOLITE, CENTRALLASSITE, CERINITE, *H. How*, (Ed. new Phil. Jour., x, 84).—Prof. How has described three new species of silicates occurring in a reniform nodule in the trap of the Bay of Fundy, one mile east of Black Rock. The nodule was about half the size of a fist. It was covered with a green chlorite-like coating, and on breaking it presented a curious internal structure; immediately beneath the coating was a narrow band of a yellowish-white mineral resembling wax (*cerinite*), then a portion having a stellated appearance and a highly pearly lustre (*centrallassite*), while the centre was principally made up of a bluish-gray opaque mineral in rounded spots (*cyanolite*). A careful separation of the constituents showed—1. *Cyanolite*, comprising the centre of the nodule, was amorphous; hardness=4·5; sp. gr.=2·495; fracture flat-conchoidal, even; streak white, lustre dull, color bluish-gray; sub-translucent in thin pieces, and the powder transparent under the microscope. Decomposed with chlorhydric acid, affording slimy silica, but does not gelatinize either before or after heating. In matrass becomes white and gives off water. B.B. in platinum forceps fuses only on the thin edges, with soda and borax gives transparent beads, with salt of phosphorus a translucent glass. Analysis gave—

	S̈i	Ä̈l	Ċa	Ṁg	K̇	Ḣ	
1.	74·15	0·84	17·52	*tr.*	0·53	7·39	=100·43
2.	72·52	1·24	18·19	*tr.*	0·61	6·91	= 93·47

Analysis No. 2 was made on a specimen not perfectly free from *centrallassite*. Disregarding the small amount of alumina and potash in No. 1, we have the oxygen ratio Ċa : S̈i : Ḣ as 1 : 7·85 : 1·31 or 4 : 31·40 : 5·2, from which Prof. How draws the formula Ċa⁴S̈i₁₀+5Ḣ=S̈i 74·26, Ċa 18·36, Ḣ 7·37. Considering the water as basic the ratio of the oxygen in all the bases to that of the silica is as 1 : 3·2, approximating to that of Edelforsite, Ċa S̈i or 1 : 3. The name *cyanolite* is in allusion to the blue tint which distinguishes this mineral from its associates.

2. *Centrallassite* occurs in spherical concretions between the cyanolite and the rind. The concretions when broken have a lamellar structure and consist of plates diverging from a centre; the plates have a pearly lustre, but the mineral passes into an opaque white form. Centrallassite has a white, sometimes yellowish, color; translucent, transparent in thin plates; brittle; lustre sub-resinous; hardness=3·5; sp. gr.=2·45—2·46. In matrass yields water, becomes opaque and silvery-white. B.B. fuses readily, with spirting, to an opaque glass, with the fluxes gives a clear bead. Decomposed by chlorhydric acid without gelatinizing. The result of two analyses were:—

S̈i	Ä̈l	Ċa	Ṁg	K̇	Ḣ	
59·05	1·00	27·86	0·20	*undet.*	11·40	
58·67	1·28	27·97	0·13	0·59	11·43	= 100·07

The oxygen ratio of the mean of these analyses for the lime, silica and water is 1 : 3·91 : 1·27=4 : 15·64 : 5·08, from which Prof. How deduces the formula Ċa⁴S̈i₅+5Ḣ=S̈i 59·06, Ċa 29·20, Ḣ 11·74. From two determinations of the water and an estimation of the silica, the opaque mineral was proved to have the same composition as the transparent variety.

3. *Cerinite.* The narrow band enveloping the two preceding minerals (an eighth of an inch in thickness) was an opaque mineral, translucent in very thin fragments; amorphous; lustre sub-resinous, resembling white or yellowish-white wax; H.=3·5. B.B. fusible without intumescence. It was imperfectly decomposed by chlorhydric acid. Two analyses gave—

	Si	Al	Fe	Ca	Mg	K	H
1.	58·13	12·21	1·01	9·49	1·83	0·37	15·96=99·00
2.	57·02	13·11	1·27	10·15	1·91	*undet.*	15·42=98·88

The iron and potash in No. 1 were dissolved out by chlorhydric acid—a fusion with carbonate of soda was made to complete the decomposition. The loss in the analyses is supposed by Prof. How to be due to alkali not determined. The ratio between R, R, Si, H is as 1 : 2 : 9 : 4, and gives the formula $3CaSi+2AlSi^2+12H$= Si 58·06, Al 14·60, Ca 11·96, H 15·38.

Datholite [p. 334, I—IV, VI].—J. D. Whitney has described a peculiar variety of this mineral, which occurs in nodules in the Minnesota mine, Lake Superior (this Jour. [2], xxviii, 13). The mineral is quite compact and breaks with a conchoidal fracture; it is perfectly white and opaque, resembling in physical character the purest and most close-grained marble. H.=4·5; sp. gr. 2·983. Analysis by C. F. Chandler gave—

Si	Fe, Al	Ca	B (loss)	H
37·41	0·35	25·11	21·40	5·73 = 100.

Q. Sella has in his collection, a crystal of datholite from Baveno, 4½ inches long by 3¾ inches broad, and 1½ inches in thickness.—(Wien Akad. Berichte, xxix, 239.)

Diaspore.—See under *Natrolite.*

Embolite [p. 93].—F. Field has given analyses of three varieties of chloro-bromid of silver from Chañarcillo, in the province of Atacama (Quar. Jour. Chem. Soc., x, 239):

	Ag	Br	Cl		
1.	68·22	16·84	14·92	=	99·98
2.	66·94	19·82	13·18	=	99·94
3.	61·07	33·82	5·00	=	99·89

No. 1 had a pale green color, and its formula is 2AgCl+AgBr. No. 2, of a darker color, and of more frequent occurrence, is identical with Breithaupt's *embolite,* as analyzed by Plattner, 3AgCl+2AgBr. No. 3 was of a very dark green color, sometimes having a purple tint, its formula is AgCl+3AgBr.

Under the names *megabromite* and *mikrobromite* Breithaupt has described two new chloro-bromids of silver (B. u. H. Zeit., xviii, 449). I. *Megabromite.* Lustre adamantine; color siskin to pistachio-green, changing on exposure to the light, to blackish-gray; streak pale green. Crystalline form cubic; cleavage cubic, though not always distinct; fracture conchoidal and uneven; slightly malleable and sectile. H.=2·75—3; sp. gr. 6·230—6·234. Occurs in compact limestone. Analysis by T. Richter:

Ag	Br	Cl	I
64·19	26·49	9·32	*tr.*

The relations of Ag, Br and Cl are as 2·26 : 1·26 : 1, or as 9 : 5 : 4=4AgCl+5AgBr. It bears a very strong resemblance to embolite in physical characters.

II. *Mikrobromite.* Lustre adamantine; color between asparagus and greenish-gray, on exposure becomes ash-gray and opaque; streak white, translucent; crystalline form, cubic; fracture irregular, and without any regular cleavage; very sectile and malleable. H.=2·5—3. Sp. gr. 5·75—5·76. Occurs with native silver in a yellowish-red compact limestone at Copiapo in Chile. Two analyses by Richard Müller gave—

	Ag	Br	Cl
1.	70·28	12·35	17·37
2.	69·81	12·44	17·75

The ratio of Ag, Br and Cl is as 4 : 1 : 3, giving the formula AgBr+3AgCl.

[In this connection it may be interesting to notice the remarks of Domeyko upon the chloro-bromids of silver (Elementos de Mineralogia, 202). He says: "the chloro-bromids vary in color, from grayish-green or yellow, to asparagus and pistachio-green. In general the specimens that have a yellow color have more bromine, and consequently less silver, than those of a gray or pearly green color." Analyses of three specimens of the yellow variety from the mines of Chañarcillo gave Domeyko:

	AgCl	AgBr		Ag	Br	Cl
1.	51·00	49·00	=	66·53	20·85	12·62
2.	52·80	47·20	=	64·84	20·09	13·07
3.	51·00	49·00	=	66·53	20·85	12·62

The ratio of the atoms of Ag, Br and Cl in Nos. 1 and 3, are as $2\frac{1}{3} : 1 : 1\frac{1}{3}$ or 7 : 3 : 4, giving the formula 4AgCl+3AgBr. No. 2 has the ratio $2\frac{1}{3} : 1 : 1\frac{1}{3}$ or 5 : 2 : 3, giving the same formula as Breithaupt's embolite, 3AgCl+2AgBr. Domeyko also gives four analyses of the grayish green variety which occurs in masses an inch or more in thickness. Of these Nos. 4, 5 and 6, as analyzed below, were from Chañarcillo and 7, from Quillota. All the specimens examined were remarkably homogeneous and pure, some of them as translucent as wax.

	AgCl	AgBr		Ag	Br	Cl	Ratio.
4.	72·9	27·1	=	70·44	11·53	18·03	9 : 2 : 7
5.	65 6	34·4	=	69·14	14·63	16·23	7 : 2 : 5
6.	81·4	18·6	=	71·94	7·92	20·14	20 : 3 : 17
7.	66·4	33·6	=	69·28	14·30	16·42	15 : 4 : 11

If we now recapitulate these together with Field's analyses and the analyses of the three species of Breithaupt, in the order of the increase of bromine, we have:

	Ag	Br	Cl	
Pearly green, Chañarcillo, (6),	71·94	7·92	20·14	Domeyko.
" " " (4),	70·44	11·53	18·03	"
Mikrobromite, Copiapo,	69·84	12·39	17·77	Müller.
Pearly green, Quillota, (7),	69·28	14·30	16·42	Domeyko.
" " Chañarcillo, (5),	69·14	14·63	16·23	"
Light green, "	68·22	16·84	14·92	Field.
Embolite, "	66·94	19·82	13·18	"
" "	66·86	20·08	13·05	Plattner.
" " (2),	66·84	20·09	13·07	Domeyko.
Yellow, " (1 and 3),	66·53	20·85	12·62	"
Megabromite,	64·19	26·49	9·32	Richter.
Dark green, Chañarcillo,	61·07	33·82	5·00	Field.

Here then are ten distinct chemical compounds formed by the union of various proportions of AgCl and BrCl, and so far as known, they all crystallize in the monometric system. As both *bromyrite* (AgBr) and *kerargyrite* (AgCl) crystallize in the monometric system, and as Cl and Br are isomorphous and may replace each other in an infinite number of proportions, it is well to ask, where we shall stop in the making of new species. The five varieties which we have quoted from Domeyko, together with the two varieties analyzed by Field, deserve to rank as species quite as much as embolite, megabromite, and mikrobromite. The varieties of chlorobromid of silver seem to shade insensibly into each other—the specific gravity increases, and the color deepens in proportion with the increase of bromine. We have already the name embolite admitted in the science, and if the native chloro-bromid should be found which has the ratio 2 : 1 : 1 or AgCl+AgBr, it would have the same right to be ranked a species as dolomite, but we protest against making ten or more species of Ag (Br, Cl), for the same reasons that we should protest against making distinct species of all of the varieties of dolomitic limestone.—G. J. B.]

FERGUSONITE [p. 350, III].—R. Weber has analyzed *fergusonite* from West Greenland (Pogg. Ann., cvii, 590):

Ĕb	Ŝn	Żr	Ẏ	Ċe	Ḟe	Ŭ	
48·84	0·35	6·93	38·61	3·05	1·48	0·35	= 99·61

This, although differing somewhat from the former analysis by Hartwall, proves the mineral to be distinct from the Norwegian *tyrite*.

FRANKLINITE [p. 166, I, VII].—The chemical composition of this mineral has been carefully studied by Rammelsberg (Pogg. Ann., cvii, 312), and the causes of error, and the disagreement in former analyses pointed out. His analyses, partly from massive, and partly from crystallized specimens, gave:

G.=5·21		1.	2.	3.	4.	5.
	Fe	64·28	65·32	64·92	63·40	64·64
	Mn		13·08	13·87	13·28	13·81
	Zn			25·09	26·83	25·51
				103·88	103·51	103·96

Analyses 4 and 5 were made by Schulz in Rammelsberg's Laboratory. The mean is Fe 64·51, Mn 13·51, Zn 25·30 (excluding Zn in No. 4) =103·52, equal to

	Fe	Mn	Zn	O	
	45·16	9·38	20·30	25·16	= 100·00
Equivalents,	4·8	1·	1·8	9·3	

The atomic proportion between the metals and the oxygen is 7·6 : 9·3=1 : 1·2=5 : 6 or R^5O^6. Rammelsberg proves by experiment that at least a *portion* of the manganese must be sesquioxyd, and after the consideration of several hypotheses in regard to the oxydation of the iron and manganese, which show the impossibility of the composition of the mineral corresponding to the spinel formula, he is led to assume the *whole* of the manganese to exist as sesquioxyd. He then calculates the oxygen remaining, after deducting that united with the zinc and manganese, as belonging to the iron. This gives—

	a	Oxygen.		*b*	Oxygen.	
Mn	13·51	4·13	13·61	13·51	4·13	12·38
Fe	31·64	9·48		27·50	8·25	
Fe	29·55	6·55	11·55	33·31	7·38	12·38
Zn	25·30	5·00		25·30	5·00	
	100·00		25·16	99·62		24·76

Column *b* is a correction of the calculation so as to make the oxygen of the protoxyds and sesquioxyds equal, and corresponds to the amount of iron found in the analyses. The oxygen thus calculated differs but 0·4 per cent from the total oxygen.

The calculation of the compound R^5O^6 in which Mn : Zn : Fe=1 : 2 : 5 gives Fe 45·24, Mn 8·92, Zn 21·02, O 24·81, or Fe 64·66, Mn 12·80, ZnO 26·19=103·65, corresponding very well with the results of the analyses, and giving the formula $(\dot{F}e\dot{Z}n)^3(\ddot{F}e\ddot{M}n)$ or $\dot{R}^3\ddot{R}$. Rammelsberg considers the isomorphism of $\dot{R}\ddot{R}$ with $\dot{R}^3\ddot{R}$ as a necessary consequence of the isodimorphism of the oxyds $\dot{R}$ and $\ddot{R}$, already shown in his recent investigations on hornblende, augite, and the different varieties of specular and titanic iron. [An analysis of *franklinite*, made by the writer in the autumn of 1858, gave results agreeing very nearly with the composition obtained by Rammelsberg, viz. Fe 65·05, Mn 14·77, Zn 23·30, insoluble 0·30=103·12.—G. J. B.]

GALENA [p. 36, II—IV, VII].—The so-called *steinmannite*, already referred to galena by Kenngott (Uebersicht, 1855, 109), has recently been analyzed by Schwarz (*Reuss*, Wien. Akad. Ber., xxv, 561), with the following results:

PbS	As_2S_3	SbS_3	ZnS	FeS	
76·48	9·25	0·77	11·38	2·10	= 99·98

Another specimen gave 2 p. c. less lead, a trace of zinc, and scarcely any arsenic, but contained a large amount of antimony. In a third sample a small portion of silver was found. From these facts Prof. Reuss draws the conclusion that sulphid of lead is the only constant constituent, and that *steinmannite* is an impure galena.

GARNET [p. 190, I—VII].—Analyses of *lime-iron-garnet* from the Schischimsk Mts. (1.), and from Achmatowsk (2.), and the *grossular* from the Slüdianka River (3), made under the direction of N. v. Iwanow in the Mining-Department Laboratory in St. Petersburg gave (Kokscharow, Mat. Min. Russlands, iii, 79):

		$\ddot{S}i$	$\ddot{A}l$	$\ddot{F}e$	$\dot{C}a$	$\dot{M}g$	$\dot{M}n$
1.	G.=3·798.	35·21	*tr.*	34·11	30·96	*tr.*	*tr.*=100·28
2.	————	37·22	6·04	24·81	31·07	0·49	*tr.*= 99.63
3.	G.=3·427.	40·99	14·90	10·94	32·94	0·98	—=100·75

An extended notice of the occurrence of *garnet* in Russia, with description of interesting crystals is given by Kokscharow in his Materialen zur Mineralogie Russlands, iii, 1—40.

GERSDORFFITE [p. 58, VII].—Dr. Genth has detected crystals of this mineral occurring as an incrustation upon partially decomposed galena and blende at Phœnixville, Pa. The crystals are cubes with octahedral planes, and sometimes, though rarely, pentagonal dodecahedrons are found.—This Jour., [2], xxviii, 248.

GLASERITE [p. 365, III].—Prof. W. J. Taylor refers to *glaserite*, with a query, a sulphate of ammonia and potash from the Chincha Islands. It occurs in concretions a half or three-quarters of an inch in diameter. Color yellowish-white; structure crystalline; taste pungent and bitter; opaque; permanent in air. Hardness 2. B.B. blackens and fuses with difficulty, giving a white bead. The results of two analyses were:

	$\ddot{S}O_3$	NH^4O	KO	NaO	
1.	48·40	5·37	43·45	1·68	= 98·90
2.	48·30	5·10	46·49		= 99·89

Both specimens contained traces of organic matter. The composition gives the formula $(\dot{N}H^4O, KO, NaO)\ddot{S}O^3$, which differs from that of glaserite only in having a portion of the potash replaced by ammonia and soda (Proc. Acad. Nat. Sci. Philad., Nov., 1859).

HALLOYSITE [p. 251].—Nöggerath has described as a variety of opal, a mineral occurring in a soft gelatinous state in trachyte in the opal mine at Czerweitza in Hungary (Verhand. d. naturhist. Ver. d. Rheinlande, xv, cii). Upon exposure to the atmosphere the mineral hardens, and its characters approach those of jasper-opal. Analysis by Landolt showed the mineral to lose 5·30 p. c. by drying over sulphuric acid, and the dried substance gave:

$\ddot{S}i$	$\ddot{A}l\ddot{F}e$	$\dot{C}a$	$\dot{H}$	
46·96	36·56	*tr.*	16·10	= 99·62

[Assuming the iron to be an unimportant ingredient, this composition corresponds to the varieties of *halloysite* from Anglar and Houscha (Min., p. 151, anal. 1, 2).—G. J. B.]

HAYESINE [p. 394, III, IV].—Analyses of very pure *hayesine* by Reichardt (Kopp's Jahresbericht, 1858, 737):

	$\ddot{B}^a$	$\dot{C}a$	$\dot{N}a$	$\ddot{S}$	Cl	Insol.	$\dot{H}^b$	$\dot{H}^c$
1.	52·05	11·56	*tr.*	0·53	0·94		33·53	1·38
2.	50·42	12·10	*tr.*	1·07	1·21	0·67	33·67	0·87

(*a*) by the difference. (*b*) expelled at a red heat. (*c*) expelled at 100° C.

No. 1 was a specimen from the German importers, and 2 was received direct from Lima. Reichardt gives the formula $\dot{C}a\ddot{B}^4+10\dot{H}$. An analysis of *hayesine* by F. W. Helbig (Dingler's Polytech. Jour., cxlvii, 319) gave $\ddot{B}$ 46·46, $\dot{C}a$ 14·03, $\dot{N}a$ 5·17, $\dot{H}$ 32·61, NaCl 1·89, $\dot{M}g$ and $\ddot{S}i$ traces. Additional analyses of the commercial article are given in Barreswil's Répertoire de Chimie Appliquée, i, 215.

HEMATITE [p. 113, II, III, IV, VII].—A specimen of tabular crystalline hematite from Vesuvius analyzed by Rammelsberg (Pogg. Ann., cvii, 453) gave $\ddot{F}e$ 98·05 $\dot{M}g$ 1·40=99·45. It contained no protoxyd of iron.

Analyses of hematite from the Lake Superior region by Prof. J. D. Whitney (this Jour., [2], xxviii, 13):

	I.			II.		III.	
	a.	*b.*	*c.**	*a.*	*b.*	*a.*	*b.*
Insoluble,	1·02	·80	·54	7·92	7·96	1·99	2·05
Iron,	69·41	70·22	69·96	64·42	64·01	68·81	
Oxygen and traces, lime, &c.,	29·57	28·98•	29·50	27·66	28·03	29·20	

* Mean of three closely-agreeing determinations.

I. from the Jackson Mountain, II. from the Cleveland, and III. from the Burt or Lake Superior Mountain.

HOMICHLINE [VII].—This mineral was referred to *barnhardtite* in the last supplement, but the recent analysis of Richter, published by Breithaupt in the B. u. H. Zeitung, xviii, 321, gives its composition as Fe 25·81, Cu 43·76, S 30·21, and the formula $(Cu^2S)^3$, Fe^2S^3+2FeS. Sp. gr. 4·47—4·48, (Breithaupt.) [The identity of crystalline form of this mineral with chalcopyrite, together with its less degree of hardness, and the difficulty of obtaining it pure and free from admixture with chalcopyrite, would seem to indicate that it might be a product of decomposition of this latter species, or perhaps a mixture of this species, with some of the richer sulphids of copper, such as erubescite or copper-glance. It is interesting in this connection to note Dr. Genth's remarks upon the occurrence of barnhardtite with copper-glance and chalcopyrite at the Pioneer Mills mine (this Journal, [2], xxviii, 248). —G. J. B.]

HORNBLENDE [p. 170, I—IV, VI, VII].—A. Knop has published a description and several analyses by himself and W. Hoffman of an interesting soda hornblende from the serpentine rock at Waldheim in Saxony (Ann. d. Chem. u. Pharn., cx, 363). Color leek-green; translucent; occurring in veins of an inch in thickness and resembling actinolite. H.=5. Sp. gr. 2·957.

	Si	Al	Fe	Mn	Ca	Mg	Na	
1.	58·71[a]	1·52	5·65	0·25	11·53	10·01	12·38=100·05	Knop.
2.	58·45[a]	1·92	5·53	0·51	10·28	11·12	12·61=100·42	Hoffmann.
3.	58·45[a]	1·74	5·79	0·32	10·76	10·83	12·93=101·12	"

(*a.*) Mean of two determinations.

It lost 0·5 per cent by ignition. [The analyses give too much silica for the hornblende formula, but this may be accounted for on the supposition that the mineral was partially decomposed, when treated by hydrochloric acid to free it from adhering carbonates. The large percentage of soda is remarkable.—G. J. B.]

IODYRITE [p. 95, 506].—An analysis of iodyrite from Delirio's Mine, Chañarcillo, afforded F. Field, Ag 45·98, I 54·02=AgI.—(Quar. Jour. Chem. Soc., x, 241).

IRIDOSMINE [p. 19, I].—Analyses of *iridosmine* from various localities by Deville and Debray (Ann. Chim. et Phys., [3], lvi, 481).

	Ir	Rd	Pt	Ru	Os	Cu	Fe	
1. Columbia,	70·40	12·30	0·10	——	17·20	——	——	=100·
2. "	57·80	0·63	——	6·37	35·10[a]	0·06	0·10	=100·06
3. California,	53·50	2·60	——	0·50	43·40	——	——	=100·
4. Australia,	58·13	3·04	——	5·22	33·46	0·15	——	=100·
5. Borneo,	58·27	2·64	0·15	——	38·94	——	——	=100·
6. Russia,	77·20	0·50	1·10	0·20	21·00	*tr.*	——	=100·
7. " G.=18·9,	43·28	5·73	0·62	8·49	40·11	0·78	0·99	=100·
8. " G.=18·8,	64·50	7·50	2·80	——	22·90	0·90	1·40	=100·
9. " G.=20·4,	43·94	1·65	0·14	4·68	48·85	0·11	0·63	=100·
10. " G.=20·5,	70·36	4·72	0·41	——	23·01	0·21	1·29	=100·

(*a.*) In this analysis, the osmium was determined directly, in the others by difference.

IRON [p. 17, II, VII].—F. A. Genth describes in this Journal, [2], xxviii, 246, a specimen of what appears to be telluric iron. It is said to occur near Knoxville, in Tennessee, although its exact locality is not known. It contains neither carbon, phosphorus or sulphur, and its peculiar appearance together with its being associated with a silicate of magnesia, iron and lime, render it probable that it may be a genuine specimen of *native iron*. Dr. Genth describes the mass examined, to have been about one and a half inches square, and three-eighths of an inch in thickness. The

iron had a grayish-white color, a hackly fracture, and broke easily into fragments, which though crystalline, did not show any distinct planes. It was soft, scarcely scratching fluor-spar. Lustre eminently metallic. Readily dissolved by nitric acid. Composition:—

Fe	Ni	Co	Mg	Ca	Si	
99·790	0·140	*tr.*	0·022	0·121	0·075	= 100·148

A similar mineral has been received by Dr. Genth from Northern Alabama, and it is exceeding desirable that more definite information should be obtained in regard to the locality and mode of occurrence of this problematical substance.

KERARGYRITE [p. 92, IV].—A specimen of chlorid of silver from the "Republicana Mine," Chañarcillo, analyzed by F. Field (Quar. Jour. Chem. Soc., x, 239) contained:

Ag	Cl		
75·27	24·73	=	AgCl.

LABRADORITE [p. 237, II, VII].—Vom Rath gives as the composition of the *labradorite* from the gabbro of Marmorera in Graubündten:

	Si	Al	Fe	Ca	Mg	K	Na	
G.= 2·840.	55·45	22·12	4·28	9·68	1·30	1·64	5·73	=100·20

This mineral lost 2·76 p. c. on ignition.—Zeitsch. d. deutschen geolog. Gesellschaft, ix, 246.

LIBETHENITE [p. 420].—Analyses of *libethenite* from Congo in Portuguese Africa by Hugo Müller (1.) (Quar. Jour. Chem. Soc., xi, 242); from Libethen (2.) by Bergemann, and from Nischne-Tagilsk (3.) by Chydenius (Kopp's Jahresbericht, 1858, 726):

	Cu	P	As	H	Fe	C	
1. Congo,	67·21	28·76		4·03			=100·00
	66·76	29·02		4·22			=100·00
2. Libethen,	66·29	26·46	2·30	4·04			= 99·09
3. Nischne-Tagilsk,	64·47	29·48	*tr.*	3·68	1·77	0·82	=100·22

LILLITE, *Reuss* (Wien Akad. Ber., xxv, 550).—This name has been given by Reuss to a mineral which occurs at Przibram in Bohemia. In physical characters it resembles glauconite, and appears to be a product of the decomposition of pyrites. It is an amorphous, lustreless, earthy substance, having a hardness = 2, and sp. gr. 3·043. Color blackish-green, in very fine powder under the microscope is leek-green by transmitted light. Material selected as pure as possible gave Payr on analysis:

Si	Fe	CaC	FeS (insol.)	H	
32·48	54·95	1·96	0·63	10·20	= 100·22

On treating the mineral with nitric acid, Payr found after ignition and making allowance for the water, the sulphur of the pyrites, and the carbonic acid, that the iron in the mineral had absorbed 3·43 per cent of oxygen, so that deducting this from the 54·95 Fe we have 51·52 per cent of iron plus oxygen. This gives a total of 96·79, a loss of 3·21 per cent in the analysis. The author places the species near hisingerite and cronstedite. It corresponds very closely in chemical composition with the variety of hisingerite from Riddarhyttan in which Rammelsberg found (Min., p. 290):

Si	Fe	Fe	Ca	Mg	H
33·07	34·78	17·59	2·56	0·46	11·54

MAGNESITE [p. 447, II, III].—Analyses of the magnesite from Snarum and Frankenstein by T. Scheerer (Jour. f. prakt. Chem., lxxvi, 424):

	C	Mg	Fe	Ca	
Snarum (crystallized),	52·13	46·66	0·78	0·43	= 100·00
Frankenstein (amorphous),	55·34	47·43	—-	0·22	= 100·00

The small amount of mechanical mixture, amounting in the Snarum specimen to 0·05--0·1405 per cent, and in the Frankenstein specimen to 0·048 p. c., have been subtracted from the above.

MAGNOFERRITE.—Rammelsberg (Pogg. Ann., cvii, 451) gives this name to the octahedral iron which occurs interlaminated with hematite, in the fumaroles formed at Vesuvius after the eruption of 1855. His former analyses showing the presence of a considerable amount of magnesia are contained in Suppl. VII. Two additional analyses of portions selected out by means of the magnet from the finely pulverized mineral gave:

		Ḟe	Ṁg	Ċu	Insol.
1.	G.=4·568.	82·91	13·60	0·99	2·51 = 100·01
2.	G.=4·638.	83·30	13·41	0·59	2·00 = 99·30

which, excluding the oxyd of copper and insoluble portions, gives (1.) Ḟe 85·92, Ṁg 14·09=100·01, and (2.) Ḟe 85·51, Ṁg 13·77=99·28.

The former analyses (Suppl. VII) thus calculated are: *a*. Ḟe 86·96, Ṁg 12·59= 99·55; *b*. Ḟe 84·20, Ṁg 16·00=100·20; *c*. Ḟe 84·35, Ṁg 15·65=100. Analysis *a* was made from selected crystals, *b* was a portion extracted by the magnet from the associated hematite, while *c* was a specimen thus selected from one of the older Vesuvian hematites. Rammelsberg considers the composition of the crystals as $\dot{M}g^m\dot{F}e^n$ in which probably $m=3$ and $n=4$, the regular (monometric) form being due to the isodimorphism of Ṙ and Ḟ.

MARGARODITE [p. 223].—An analysis of an authentic specimen of margarodite from the original locality at Pfitsch gave Hlasiwetz (Kenngott's Uebersicht, 1858, 67):

S̈i	Ä̇l	Ḟe	Ċa	K̇	Ṅa	Ign.
45·48	33·80	6·25	0·48	7·31	6·22	0·36 = 99·90

Kenngott remarks that this composition may be represented by the formula $\dot{R}\ddot{S}i + 2\dot{H}\ddot{S}i$, but adds that this is of little value, as on closer examination with the magnifier, the specimen proved to be an intimate mixture of a mica with granular quartz and minute crystals of feldspar. [The mica from Lane's Mine, analyzed by Smith and myself, and referred by Dana to margarodite, is distinctly foliated and apparently perfectly homogenous. It is identical in composition with the so-called margarodite from St. Etienne analyzed by Delesse (Min., p. 224).—G. J. B.]

MARIONITE (*Elderhorst*), see *Zinc-bloom.*

MEGABROMITE (*Breithaupt*), see *Embolite.*

MIKROBROMITE (*Breithaupt*), see *Embolite.*

MISPICKEL [p. 62, 509, I, II, III, V].—Analyses of mispickel from Sahla in Sweden by J. Potyka (Pogg. Ann., cvii, 304):

	S	Fe	As	Sb	Bi
G.=6·095.	19·13	34·78	43·26	1·29	0·14 = 98·60

These results give the received formula, $FeAs_2 + FeS_2$, differing from the analysis by Behncke (Suppl. III), which corresponded to $3FeS^2 + 2Fe^2As^3$. Potyka shows the want of agreement between the analyses to be due to the fact that mispickel suffers partial decomposition by simply boiling in water. The sp. gr. of small fragments he found to be 6·043—6·047, that of the powder boiled for some time in water was only 5·819 to 5·874, and on examination of the water appreciable quantities of sulphuric acid, iron and arsenic were found in solution.

C. v. Hauer obtained in two analyses of mispickel from Kindberg in Styria:

S̈i	Ä̇l	Ċa	Fe	As	S
5·0	1·0	0·3	30·8	43·2	18·9 = 99·2
0·7	0·3	*tr.*	32·7	45·0	21·0 = 99·7

—Jahrb. d. k. k. geolog. Reichsanstalt in Kopp's Jahresbericht f. 1858, p. 678.

According to Daubrée (Compt. Rendus, 1858, xlvii, 959) the lignite of the tertiary formation at Lobsann (Lower Rhine) contains from 0·002—0·0008 per cent of arsenic, and on dissolving the bituminous limestone from the same locality a fine amorphous residue (amounting to about 2 p. c.) is obtained, which gives the reactions of mispickel.

MOLYBDATE OF IRON [p. 144, I, II].—The so-called *molybdate of iron* described by D. D. Owen has recently been examined by Dr. Genth (this Jour., [2], xxviii, 248), and from the varying proportions of the iron—in one case 35 p. c., in another 24·3—he questions whether the substance may not be a mechanical mixture of molybdine and limonite.

MOSSOTTITE.—See *Aragonite.*

NAGYAGITE [p. 65].—Folberth has analyzed the foliated-tellurium from Nagyag. It occurs in six-sided tables in a pearl-gray quartz, and has a specific gravity =6·68. Treatment with sulphid of carbon extracted 25 p. c. of the amount of sulphur. Two analyses gave (Verhandl. d. siebenbürg. Ver. f. Naturwissensch., viii, 99, in Kenngott's Uebersicht f. 1856–7, 179):

Pb	Au	Sb	S	Te	Se	
60·83	5·84	3·69	9·76	17·22	*tr.*	= 97·34
60·27	5·98	3·86	9·68	18·04	*tr.*	= 97·83

differing very materially from the previous analyses by Klaproth, Brandes and Schönlein.

NATROLITE [p. 327, VI, VII].—A variety of transluscent natrolite from Fassa in Tyrol, analyzed by Hlasiwetz, gave the following composition (Kenngott's Uebersicht, 1858, 72):

$\ddot{S}i$	$\ddot{A}l$	$\dot{C}a$	$\dot{M}g$	$\dot{N}a$	$\dot{H}^a$	$\dot{H}^b$	
43·34	27·43	3·60	0·40	9·00	10·30	0·90	= 99·97

(*a*) basic water. (*b*) hygroscopic water.

agreeing very nearly with the composition of galactite, which has been shown to be a variety of natrolite by Dana and Heddle (Suppl. I and III).

In an article upon *Spreustein* (natrolite) (Pogg. Ann., cviii, 431) Scheerer shows the cause of color, of the red and brown varieties of this mineral, to be due to mechanical impurities. A microscopical examination of several varieties showed that only the perfectly white specimens were entirely free from mechanical mixture. The white varieties were perfectly decomposed by chlorhydric acid giving a homogeneous jelly, while with the colored varieties the gelatinized mass always contained suspended more or less of an opaque white powder. If however, the decomposition was made with nitric acid, this powder retained the original color of the natrolite. A separation of the insoluble powder on some twenty grams of the mineral gave material to determine the character of this substance. The results of two analyses prepared from different varieties gave:

	$\ddot{S}i$	$\ddot{A}l$	$\ddot{F}e$	$\dot{H}$	
1.	1·58	76·75	6·77	14·70	= 99·80
2.	0·82	82·56	1·52	15·00	= 99·90

These give the formula $\ddot{R}\dot{H}$, and the powder is *diaspore* in which a portion of the alumina is replaced by iron. The quantity of this mineral in the specimens of natrolite analyzed by Scheerer varied from 4 to 7 p. c. This will explain the reason of the different analyses of Spreustein differing from each other, and also from pure natrolite. The following analyses may serve as examples. I. Crystallized colorless natrolite from Brevig analyzed by Dr. Sieveking in Scheerer's laboratory. II. Dark brownish-red Spreustein from an island of Brevigfjord, by Scheerer.

	$\ddot{S}i$	$\ddot{A}l$	$\ddot{F}e$	$\dot{C}a$	$\dot{N}a$	$\dot{H}$	
I.	47·16	26·13	0·53	0·53	15·60	9·47	= 99·42
II.	44·50	30·05	0·98	0·83	13·52	9·93	= 99·81

II. contained 6¾ p. c. of diaspore, which when subtracted from the above gave $\ddot{S}i$ 47·47, $\ddot{A}l$ 26·83, $\ddot{F}e$ 0·60, $\dot{C}a$ 0·88, $\dot{N}a$ 14·42, $\dot{H}$ 9·61=99·81; this is almost exactly the composition obtained for I. Scheerer adds that the so-called *brevicite* (Min., 327, anal. 14, 15, and 16) is nothing more than natrolite, which contains a considerable percentage of diaspore. For the further consideration of the disputed points upon the paramorphous nature of *Spreustein* (Paläo-Natrolith) see the original paper in Pogg. Ann., cviii, pp. 416—435.

NEPHELINE [p. 232, II].—P. v. Pusirewsky has analyzed the *elæolite* which is associated with cancrinite, zircon and other minerals in the Graphite-Mine at Mariinskaja in the Tunkinsk Mts. (Kokscharow Mat. Min. Russlands, III, 78), and J. P. Kimball has described the same variety of nepheline, occurring with sodalite at Salem, Mass. (this Jour., [2], xxix, 65):

	Si	Al	Fe	Ca	Mg	Na	K	Ign.
1. Mariinskaja,	44·94	30·29	0·72	1·15	0·15	21·80	1·48	—=100·53 P.
2. Salem, G.=2·63.	44·31	32·80	*tr.*	0·40	—	16·43	5·50	1·47=100·91 K.

Nickel and Copper, arseniuret of.—This ore, mentioned by T. Sterry Hunt (this Jour., [2], xix, 417) as a mixture of *domeykite* and *copper-nickel*, has since been thoroughly examined by both Prof. Hunt (Rep. Geol. Survey, Canada, 1853–6, p. 388) and Prof. J. D. Whitney (this Jour., [2], xxviii, 15) giving analyses which confirm the above conclusion.

NICKEL-GYMNITE [p. 286, VII].—An ore, apparently an impure variety of this mineral, is described by T. Sterry Hunt (this Jour., [2], xix, 417, and Rep. Geol. Survey, Canada, 1853–6, p. 389), as occurring with the nickel ores of Michipicoten Island, Lake Superior.

OLIGOCLASE [p. 239, I].—Vom Rath has given analyses of *oligoclase* from the granite of Albulaberge, and also of a compact *lime oligoclase* from the diorite of Piz-Rosag, in Granbündten (Zeitschr. d. deutsch. geol. Gesell., ix, 226, 259):

	Si	Al	Fe	Ca	Mg	K	Na
Albulaberge, G.=2·725.	62·01	21·16	2·54	3·53	0·78	4·33	5·94=100·29
Piz-Rosag, G.=2·835.	57·64	22·99	3·92	8·09	0·37	1·79	5·25=100·05

The analyses were made on the ignited mineral. The specimen from Albulaberge lost 1·05 per cent, and that from Piz-Rosag 1·32 per cent on ignition.

The leek-green *feldspar* associated with pyrrhotine at Bodenmais (Bavaria) has been analyzed by Potyka (Pogg. Ann., cviii, 366). It is triclinic, and has the characteristic striæ on the cleavage surfaces. Sp. gr. 2 604. Composition:

Si	Al	Fe	Ca	Mg	K	Na
63·12	19·78	1·51	0·66	0·13	12·57	2·11 = 99·87

This gives an oxygen ratio of R : R : Si, of 1 : 2·86 : 10·17 or nearly 1 : 3 : 10,—a ratio intermediary between that of oligoclase and orthoclase; the sp. gr. (2·604) is also between that of oligoclase (2·56) and orthoclase (2·67).

ORTHOCLASE [p. 242, II, III, V—VII].—J. D. Whitney has analyzed the interesting crystallized *orthoclase* which is associated with native copper, calcite and the zeolites in many of the Lake Superior copper mines (this Jour., [2], xxviii, 16). It occurs in distinct crystals of a reddish flesh color, having a striking resemblance to stilbite. The crystals are rarely as much as one-tenth of an inch in length. Composition:

Si	Al	Fe	Mn	K	Na
65·45	18·26	0·57	*tr.*	15·21	0·65 = 100·14

OSERSKITE (*Breithaupt*), see *Aragonite*.

PECTOLITE [p. 305, II, III, VI, VII].—Analyses of three specimens of the very pure variety of this mineral from Bergen Hill, N. J., by J. D. Whitney (this Jour., [2], xxix, 205):

	Si	Ca	Mn	Fe	Na	H
1.	54·82	33·12	0·66	2·6	8·78	2·36
2.	54·76	32·88	1·16		9·17	2·03
3.	54·27	32·83	1·24		8·94	2·72

(*a*) By the difference.

The direct determination of the water on the substance dried at 80° C. gave, for 2, 3·03, and for 3, 2·75 p. c. These results agree very closely with the previous analysis published by Prof. Whitney (Min., anal. 5). Specimen 3, from the Wheatley Collection in Union College, was considered the purest, and the analyses gives

the oxygen ratio for Ḣ, Ṅa, Ċa, S̈i as 1 : 1·05 : 3·83 : 11·84 or nearly 1 : 1 : 4 : 12, or the formula, as expressed by Prof. Whitney, $\dot{N}a^3\ddot{S}i^4+4\dot{C}a^3\ddot{S}i^2+3\dot{H}=\ddot{S}i$ 54·22, Ċa 33·73, Ṅa 9·33, Ḣ 2·74. This corresponds much better with the results obtained than v. Kobell's formula, in which the oxygen ratio is 1 : 1 : 4 : 11.

Prof. Whitney calls attention to the relations of pectolite to spodumene, and also to wollastonite and pyroxene, the latter connection being more apparent when the formula is written $(\dot{C}a\frac{4}{6}, \dot{N}a\frac{1}{6}, \dot{H}\frac{1}{6})^3\ddot{S}i^2$ or $\dot{R}^3\ddot{S}i^2$.

PENNINE [p. 295, II, IV, V].—A new analysis of *pennine* from Zermatt by Victor Merz, gave (Kenngott's Uebersicht f. 1858, 63):

S̈i	Ä̈l	F̈e	Ṁn	Ṁg	Ḣ
33·26	11·69	7·20	*tr.*	35·18	12·18 = 99·51

not differing materially from the previous results of Marignac, Schweizer and Mac-Donnel. For an extended discussion of the chemical composition of this mineral by Dr. Kenngott, see loc. cit., pp. 62—66.

PHOLERITE (p. 251].—F. A. Genth describes (this Jour., [2], xxviii, 251) *pholerite* as occurring in the coal mines of Schuylkill Co., Pa., in yellowish white scales which become of a snow white color, and pearly lustre, on being treated with chlorhydric acid. Under the microscope the scales appear to be clinorhombic, having the planes i-$\bar{i}$ and -1-i. The specimens examined were from Tamaqua near Pottsville. Analysis No. 1, was made on the original mineral, in Nos. 2 and 3 the substance had been previously treated with chlorhydric acid. Nos. 1 and 2, were decomposed by fusion with carbonate of soda—No. 3 by treatment with sulphuric acid.

	S̈i	Ä̈l	F̈e	Ċa	Ṅa	K̇	Ḣ
1.	46·93	37·90	0·18	0·93	*undetermined*		13·98 = 99·92
2.	46·98	39·65	——	——	0·11	0·06	13·69 = 100·49
3.	46·81	39·56	——	——	0·11	0·06	13·91 = 100·45

giving the formula $\dot{Al}^6\ddot{S}i^4+6\dot{H}=\ddot{S}i$ 47·06, Ä̈l 39·20, Ḣ 14·71.

PHOSPHOCHALCITE [p. 425, II, VI, VII].—Bergemann has found arsenic acid in all the native phosphates of copper.—Analysis of the *phosphochalcite* from Linz gave:

	Ċu	P̈	Ä̈s	Ḣ
Phosphochalcite,	69·97	19·89	1·78	8·21 = 99·85

(Abstract from Pogg. Ann., civ, 190, in Kopp's Jahresbericht, 1858, 726).

PITCHBLENDE [p. 107, IV, V].—Hermann has given (Jour. f. prakt. Chem., lxxvi, 326) the name *uranoniobite* to the crystallized pitchblende from Strömsheien in Norway, previously described and analyzed by Scheerer (see Min., p. 108, anal. 5, under pitchblende). Scheerer remarks in his description (Pogg. Ann., lxxii, 568) that it is possible that the metallic acids found in the analysis may be due to admixture with a substance he calls *Niob-pelopsaures Uran-Manganoxydul* (columbate of uranium and manganese) with which the pitchblende is associated;—further investigation is needed to establish its claims to be considered a distinct species.

Hermann also gives a new analysis of the *pitchblende* from Joachimsthal:

	PbS	S̈i	Ä̈l	F̈e	B̈i	Ü	Ü	Ṗb	Ṁn	Ċa	Ṁg	Ḣ
G.=6·97.	2·84	2·45	0·33	1·88	1·23	52·37	28·84	0·74	0·14	5·78	0·41	2·59

with traces of arsenic. In the same paper Hermann communicates an analysis of the so-called *pittinite* (Pittinerz, Breithaupt) from Joachimsthal, The mineral occurs in amorphous opaque masses of a pitch-black color. It has an uneven and slightly conchoidal fracture, and a highly resinous lustre. Streak greenish-brown. H.=4. Sp. gr. 5·16. Heated in tube yields water containing traces of fluorine and ammonia; fused with soda on charcoal gives a globule containing lead and bismuth. Easily decomposed by nitric acid with separation of gelatinous silica on evaporation. Composition:

S̈i	Ü	F̈e	B̈i	Ṗb	Ċa	Ṁg	Ḣ	Insol.
5·00	68·45	4·54	2·67	2·51	2·26	0·55	10·06	3·20 = 99·23

with traces of fluorine, ammonia, phosphoric and carbonic acids. [This substance is evidently very nearly related to pitchblende, and is probably a result of the alteration of that mineral. Hermann endeavors to show that silica is an essential constituent of pitchblende and allied uranium minerals, but as most of these substances are amorphous, and as their composition varies considerably, it seems possible that the silica may be due to admixture with some earthy silicate.—G. J. B.]

PITTINITE.—See *Pitchblende.*

PLATINUM [p. 12, I—IV].—Analyses of platinum from various localities, by H. St.Claire Deville and H. Debray (Ann. de Chimie, [3], lvi, 449):

	Pt	Ir	Rh	Pd	Au	Cu	Fe	X[a]	Sand	Pb(?)	Os & loss	
1.	86·20	0·85	1·40	0·50	1·00	0·60	7·80	0·95	0·95	—	—	=100·25
2.	80·00	1·55	2·50	1·00	1·50	0·65	7·20	1·40	4·35	—	—	=100·15
3.	76·82	1·18	1·22	1·14	1·22	0·88	7·43	7·98	2·41	—	—	=100·28
4.	85·50	1·05	1·00	0·60	0·80	1·40	6·75	1·10	2·95	—	—	=101·15
5.	79·85	4·20	0·65	1·95	0·55	0·75	4·45	4·95	2·60	—	0·05	=100·00
6.	76·50	0·85	1·95	1·30	1·20	1·25	6·10	7·55	1·50	0·55	1·25	=100·00
7.	51·45	0·40	0·65	0·15	0·85	2·15	4·30	37·30	3·00	—	—	=100·25
8.	45·70	0·95	2·65	0·85	3·15	1·05	6·80	2·85	35·95	—	0·05	=100·00
9.	59·80	2·20	1·50	1·50	2·40	1·10	4·30	25·00	1·20	—	0·80	=100·00
10.	61·40	1·10	1·85	1·80	1·20	1·10	4·55	26·00	1·20	—	—	=100·20
11.	77·50	1·45	2·80	0·85	*undet.*	2·15	9·60	2·35	1·00	—	2·30	=100·60
12.	76·40	4·30	0·30	1·40	0·40	4·10	11·70	0·50	1·40	—	—	=100·50

(*a.*) Iridosmine.

Nos. 1, 2, and 3 from Choco (Columbia), South America; 4, 5, and 6 from California; 7, Oregon; 8, Spain; 9, 10, Australia; 11, 12, Russia.

For analyses of platinum ore from Goenoeng Lawack in Borneo by Prof. Bleekrode see Pogg. Ann., cvii, 189.

PYRITES [p. 54, I, IV].—G. Rose has described a pseudomorph of *pyrites* after *pyrrhotine*, the crystals are six-sided prisms, two inches across and one inch in thickness (Zeitschrift d. deutsch. geolog. Gesellschaft, x, 98).

PYROMORPHITE [p. 400, II, IV].—Analyses of Russian *pyromorphite* by Struve (Kokscharow, Mat. zur Min. Russlands, iii, 42):

		PbCl	Ṗb	F̈e, C̈r	Ä̇s	V̈	P̈	
1. Beresowsk,	G.=6·715.	9·94	73·36	0·59	—	*tr.*	15·82	=99·71
2. Altai (Tomsk),	G.=5·537.	10·13	73·40	—	2·61	—	12·90	=99·04

PYROXENE [p. 158, I, II, V—VII].—Reuss has described a compact white *pyroxene* from Oberrochlitz in Bohemia. Under the microscope it shows a crystalline structure. The mineral is snow white when pure, but sometimes has a light green color from admixture with chrysocolla, malachite and allophane. H.=5·5—6. G.=3·398. Decomposed by chlorhydric acid with gelatinization. Analysis by v. Payr (Wien Akad. Ber., xxv, 557):

S̈i	Ċa	Ṁg	Ḟe	Ṁn	
55·03	20·72	15·71	4·84	3·16	=99·46

PYRRHOTINE [p. 50, I, II].—Analysis of *pyrrhotine* from Bernkastel on the Moselle by Baumert gave Fe 61·0, S 39·4, and no nickel (Verhandl. d. naturhist. Ver. d. Rheinlande u. Westphalens, xiv, s. lxxxv). For observations on nickeliferous pyrrhotine from Snarum see Müller in B. u. H. Zeitung, xvii, 304.

QUARTZ [p. 145, II—IV, VII].—Blum and Carius have described *quartz* as pseudomorph of *celestine*, from Girgenti. The crystals contained S̈i 98·80, ṠrS̈ 1·78 (Pogg. Ann., ciii, 628, in Kopp's Jahresbericht, 1858, 745).

REALGAR [p. 31, VI].—Analysis of *realgar* from Pola de Lena in Asturia, Spain, by Dr. Hugo Müller (Quar. Jour. Chem. Soc., xi, 242) gave S 30·00, As 70·25.

RIPIDOLITE [p. 296, I, V].—An interesting and peculiar variety of this mineral from Steele's Mine, Montgomery Co., North Carolina, has been described by Dr. F. A. Genth in this Journal, [2], xxviii, 250. Composition:

Si	Al	Fe	Fe	Mn	Mg	H
24·90	21·77	4·60	24·21	1·15	12·78	10·59

SAPONITE (Nicklès).—For a more extended description of this silicate noticed in the Suppl. VII, see Ann. de Chimie, [3], lvi, 46.

Saualpite.—A synonym for a variety of zoisite from the Saualp in Carinthia.

SCHEELITE [p. 347].—F. A. Genth has found *scheelite* at the Bangle Mine in Cabarras Co., and also at Flowe mine, Mecklenburgh Co., North Carolina. At the former place it occurs in granular masses three-fourths of an inch in diameter; it has a pale yellowish-brown color, and a distinct octahedral cleavage. Composition (this Jour., [2], xxviii, 252):

W	Sn	Cu	Fe	Ca	
79·52	0·13	0·08	0·18	19·31	= 99·22

The variety from Flowe mine was observed in crystals, in one case a modification of the octahedron 1, truncated by 1-*i*,—crystal about three-tenths of an inch in length; another specimen, half this size, had an orange color and was a combination of the planes $\frac{1}{2}$ and *i-i*.

Another variety from Flowe mine, forming what Dr. Genth calls *rhombic tungstate of lime*, occurs in small indistinct crystals—the largest one-quarter of an inch long. Each crystal has a nucleus of wolfram, and the following planes are given: *I*, *i*-$\bar{i}$, $\frac{1}{2}$-$\bar{i}$, 1, and 1-$\breve{i}$; cleavage could not be observed. Dr. Genth does not believe these crystals to be pseudomorphs, and suggests that tungstate of lime is dimorphous,—a conclusion which, though extremely interesting, we hesitate to accept until the subject has been more fully investigated.

SERPENTINE.—Observations on the crystalline structure of serpentine by Websky in Zeit. d. deutschen geol. Gesellsch., x, 277.

SMITHSONITE [p. 447, I, III, VII].—For analyses of zinc ores from Arkansas by Dr. Elderhorst see First Geological Report of Arkansas, pp. 147–155.

SODALITE [p. 229, II, VI].—J. P. Kimball has published a description and analysis of sodalite, from an erratic block of compact syenite at Salem, Mass. (this Jour., [2], xxix, 67). The mineral was associated with elæolite, orthoclase, biotite, zircon, and albite (?) Occurs in crystalline, sub-translucent masses; cleavage indistinct; lustre greasy; color lavender-blue. Sp. gr. on three specimens 2·294, 2·303, 2·314. Chemical composition:

Si	Al	Fe	Na	Cl	
37 33	32·70	*tr.*	24·31	6·99	= 101·33

Calculating the chlorine to exist as chlorid of sodium we have:

Si	Al	Fe	Na	Na	Cl	
37·33	32·70	*tr.*	18·17	4·57	6·99	= 99·76

corresponding very closely to the analyses of the sodalite from Litchfield in Maine by Whitney (Min., anal. 5, 6). Dr. Kimball remarks that the sodalite from both Litchfield and Salem, is found in erratic blocks, but the absence of cancrinite as an associating mineral in the Salem specimens, would seem to favor their being derived from different sources.

STROMEYERITE [p. 48].—Prof. W. J. Taylor has described and analyzed a variety of *stromeyerite* occurring at Copiapo in Chile (Proc. Acad. Nat. Sci. Phila., Nov. 1859). It is found in small six-sided trimetric crystals not larger than one-eighth of an inch in diameter. Its hardness is 2·5—3. Lustre metallic; color dark steel-gray; streak nearly black and shining. Sectile, crystals brittle. It occurs in barytes in small cavities associated with quartz crystals, and upon the latter are implanted the crystals of stromeyrite, together with small crystals of pyrargyrite. Analysis gave:

S	Ag	Cu	Fe		
16·35	69·59	11·12	2·86	=	99·92

This composition differs materially from the published analyses of stromeyerite, although not more than the analyses of specimens from different localities vary

from each other. Cu and Ag appear to replace each other in this mineral in all proportions. The formula is (Cu, Ag, Fe)S.

TALKOID, *Naumann* (Mineralogie, 5te, Aufl. 255).—The sparry crystalline talc from Presnitz described by Scheerer (Pogg. Ann., lxxiv, 321, this Jour., [2], xiv, 39) has been named *talkoid* by Naumann. It is snow white and broadly foliated occurs with magnetite at Presnitz. Sp. gr. 2·48. Composition, according to Scheerer and Richter:

	$\ddot{S}i$	$\ddot{A}l$	$\dot{F}e$	$\dot{M}n$	$\dot{C}a$	$\dot{M}g$	$\dot{H}$	
1.	58·46	0·09	1·09	——	0·61	32·83	6·56	= 99·64
2.	58·70	0·06	1·01	0·39	0·81	32·07	6·56	= 99·50

for which Naumann gives the formula $\dot{M}g^3\ddot{S}i^5+\dot{H}$.

TANTALITE [p. 351, III—VI].—A. E. Nordenskiöld has analyzed tantalite from a new locality at Björtboda in Finland (Pogg. Ann., cvii, 374):

$\ddot{T}a$	$\ddot{S}n$	$\dot{F}e$	$\dot{M}n$		
83·79	1·78	13·42	1·63	=	100·62

the oxygen ratio between the bases and the metallic acids is 1 : 4·83, most nearly resembling the composition of the Tammela tantalite.

TENNANTITE [p. 84, II].—Vom Rath has published the following analyses of tennantite from Cornwall (Verhandl. d. naturhist. Ver. d. Rheinlande u. Westphalens, xv, s. lxxii, in Kopp's Jahresbericht f. 1858, 680):

	Density.	S	Cu	Fe	Zn	As	
1*a*.	4·652.	25·22	46·88	6·40	1·33	18·72	= 98·55
1*b*.	——	27·13	44·43	6·88	1·43	20·13	= 100·00
2.	4·69.	26·34	52·97	2·82	——	18·06	= 100·19

No. 1*a* is the direct result of the analysis—the mineral was associated with black oxyd of copper, and assuming the amount of this substance to be seven per cent, and averaging the analysis to one hundred, gives the result as in No. 1*b*. Analysis No. 2 was by Baumert. According to v. Rath, the ratio between the metallic sulphids and the sulphid of arsenic in tennantite is 5 : 4, while the analogous ratio in tetrahedrite is 4 : 3.

TOURMALINE [p. 270, II, IV, VII].—Jenzsch (Pogg. Ann., cviii, 648) has examined a crystal of *tourmaline* from Elba which he considers to be optically bi-axial. He suggests, from his investigations, that although the tourmaline crystals from Elba and Penig (Saxony) approach very nearly the hexagonal form, that they belong either to the trimetric or monoclinic system—a view previously suggested by Breithaupt's measurements. Breithaupt publishes a preliminary notice in the Berg und Hüttenmannische Zeitung, xix, 93, of a forthcoming monograph on this subject.

TRIPHYLINE [p. 406, 513].—F. Oesten obtained from the analysis of a very pure specimen of triphyline from Bodenmais in Bavaria (Pogg. Ann., cvii, 438):

	$\ddot{P}$	$\dot{F}e$	$\dot{M}n$	$\dot{C}a$	$\dot{M}g$	$\dot{L}i$	$\dot{K}$	$\dot{N}a$	$\ddot{S}i$	
G.=3·545—3·561.	44·19	38·21	5·63	0·76	2·39	7·69	0·04	0·74	0·40	=100·05

This gives the oxygen ratio between the bases and phosphoric acid 15·34 : 24·77= 3·09 : 5, and the formula, $\dot{R}^3\ddot{P}$, the same as first proposed by Fuchs. Wittstein, in a recent note (Pogg. Ann., cvii, 511), calls attention to the fact that eight years since he published results giving the above formula, and says moreover, that a portion of the iron exists as sesquioxyd. Oesten has since (Pogg. Ann., cviii, 648) published proof that the specimen he examined was entirely unaltered, and that all the iron existed as protoxyd.

TYRITE (?) [I, III, IV].—Potyka (Pogg. Ann., cvii, 590) has analyzed specimens of supposed tyrite from Norway which prove to be a new columbate containing several per cent of potash, and distinct from the tyrite of Forbes. The chemical composition was found to be:

$\ddot{C}b$	$\ddot{Z}r$	$\ddot{W}$	$\ddot{S}n$	$\dot{P}b$	$\dot{C}u$	$\dot{Y}$	$\dot{C}e$	$\dot{F}e$	$\dot{U}$	$\dot{C}a$	$\dot{M}g$	$\dot{K}$	$\dot{H}$	
43·49	0·80	1·35	0·09	0·41	0·35	31·90	3·68	1·12	4·12	1·95	*tr.*	7·23	3·71	=100·20

The ratio between the metallic acids and bases, exclusive of the water is, as 1 : 1·04 or $\dot{R}^3\ddot{C}b$. The mineral occurs implanted in red feldspar in small irregular masses having an uneven fracture, but no distinct cleavage. Lustre, sub-metallic; color black, in thin splinters reddish-brown and translucent on the edges; streak reddish-brown; hardness that of apatite (5). Sp. gr. in coarse powder =5·124 (16·6° C.). When hot water is poured upon fragments a crepitation or crackling takes place. B.B. with borax gives a reddish-yellow bead while hot, which on cooling becomes yellow; with salt of phosphorus is completely dissolved to a greenish-yellow bead while hot, becoming green on cooling. No reaction for manganese with soda. Treatment with concentrated sulphuric acid gave no reaction for fluorine. [This mineral corresponds in many of its physical and blowpipe characters with the *bragite* of Forbes (see Suppl. III). Possibly a thorough analysis of authentic specimens of bragite would show them to be very nearly related, if not identical. —G. J. B.]

Uranium, silicates of, see Hermann's paper in Jour. f. prakt. Chem., lxxvi, 320.

Uranoniobite (*Hermann*), see *Pitchblende*.

URANOCHALCITE, *Hermann*.—This name has been given by Hermann to a mineral from Joachimsthal (Jour. f. prakt. Chem., lxxvi, 321). It occurs in reniform amorphous masses having a metallic appearance. Fracture compact, and slightly conchoidal, with a feeble metallic lustre; brittle; opaque; color between steel-gray and pinchbeck-brown; streak black. H.=4. Sp. gr. 5.04. Heated in a closed tube the mineral at first gives off water, and then a sublimate of realgar, and finally metallic arsenic, leaving a black residue consisting chiefly of bismuth, uranium, copper, and iron. Treated with nitric acid the mineral is dissolved with separation of sulphur. On evaporation of the solution, silica separates in the gelatinous form. The analysis gave:

S	As	Cu	Ni	Fe	$\ddot{S}i$	$\ddot{B}i$	$\ddot{U}$	$\ddot{F}e$	$\dot{F}e$	$\dot{H}$	Ag	
5·79	7·23	10·21	0·97	2·31	4·40	36·06	14·41	11·95	3·27	2·40	*tr.*	=99·00*

Hermann writes the formula $5(\dot{R}^4\ddot{S}i+4\ddot{R}\ddot{S}i+10\dot{H})+R(AsS)$. [It is quite improbable that this composition is that of a simple mineral, and until further investigation we may reasonably doubt the homogeneousness of the substance analyzed.—G. J. B.]

Vanadinite [p. 362, II—IV].—Kokscharow considers the *vanadinite* crystals from Beresowsk to be pseudomorphs of *pyromorphite*. Struve found in the interior of each vanadinite crystal a portion of unaltered pyromorphite. The mean of two analyses gave:

	PbCl	$\dot{P}b$	$\ddot{F}e\ddot{C}r$	$\ddot{V}$	$\ddot{P}$
G.=6·863.	9·60	71·13	0·43	15·92	2·92

Struve represents this composition by the formula $PbCl+\dot{P}b(\ddot{P}\frac{1}{2}, \ddot{V}2\frac{1}{2})$ or $(3\dot{P}b^3\ddot{P}+PbCl)+5(3\dot{P}b^3\ddot{V}+PbCl)$.—(Kokscharow, Mat. Min. Russlands, iii, 44).

Vivianite [p. 415, III, IV].—For an article on the composition and formation of *vivianite* by Alphonse Gages, see L., E. and D. Phil. Mag., [4], xviii, 182.

Water [p. 110].—Analysis of water from the Dead Sea, by Dr. F. A. Genth.—Ann. d. Chem. u. Pharm., cx, 240.

Wolfram [p. 351, I—IV].—F. A. Genth has published (this Jour., [2], xxviii, 253) an analysis of the wolfram which forms the nucleus of the peculiar tungstate of lime crystals alluded to under scheelite. One crystal showed the planes *I*, i-$\bar{i}$, $\frac{1}{2}$-$\bar{i}$, and 1-$\breve{i}$. Sp. gr. 7·496 (at 25° C.). Composition:

$\ddot{W}$	$\ddot{S}n$	$\dot{F}e$	$\dot{M}n$	$\dot{C}a$	
75·79	*tr.*	19·80	5·35	0·32	= 101·26

corresponding to variety II. (Min., p. 352), having the formula $4\dot{F}e\ddot{W}+\dot{M}n\ddot{W}$.

* The original gives 100, but owing to a typographical, or other error the analysis adds up only 99.

WULFENITE [p. 349, II, V].—The massive wulfenite from Garmisch, is a mixture of molybdate of lead, with carbonate of lead and other substances, as shown by Wittstein's analysis (Kopp's Jahresbericht, 1858, 721):

$\dot{P}b$	$\dot{C}a$	$\dot{M}g$	$\dot{F}e$	$\ddot{M}o$	$\ddot{S}i$	$\dot{P}$	Loss ($\ddot{C}$ & trace $\ddot{V}$)
33·80	10·85	3·57	2·80	20·00	16·20	0·04	12·74

ZINC-BLOOM [p. 460, 513, VII].—Dr. Elderhorst has described a hydrous carbonate of zinc from Marion County, Arkansas, as a new species under the name *marionite* (First Geol. Rep. Arkansas, p. 153). The chemical composition he found:

$\dot{Z}n$	$\ddot{C}$	$\dot{H}$		
73·26	15·01	11·81	=	100·08

[This is identical with analyses 1*a*, of zinc-bloom from Santander in Spain, by Peterson and Voit, published in the last supplement. This analysis gave $\dot{Z}n$ 73·1, $\ddot{C}$ 15·1, $\dot{H}$ 11·8. These analysts found that zinc-bloom undergoes a change on exposure to the air, thereby losing both carbonic acid and water. A specimen of 1*a*, exposed to the air for three months was found to contain $\dot{Z}n$ 74·73, $\ddot{C}$ 13·81, $\dot{H}$ 11·45. Other analyses by Braun are quoted in the last supplement. Peterson and Voit (Ann. d. Chem. u. Pharm., cviii, 50) give the formula for zinc-bloom $\dot{Z}n_3$, $\ddot{C}_3$, $\dot{H}_6$, which is the same as that given by Dr. Elderhorst for *marionite*;—it is an interesting fact that this is also the composition of the precipitate, produced by adding an equivalent of carbonate of soda to a zinc salt at the boiling temperature. Marionite may be considered as zinc-bloom, and the earlier analyses of this species by Smithson and Berthier, are undoubtedly less correct than those of Karsten and the more recent ones by Peterson, Voit, Braun, and Elderhorst.—G. J. B.]

Terreil mentions the occurrence of zinc-bloom at Santander in oolitic grains (L'Institut, No. 1347).