

A
S Y S T E M
OF
M I N E R A L O G Y .

DESCRIPTIVE MINERALOGY,

COMPRISING THE
MOST RECENT DISCOVERIES.

BY
JAMES DWIGHT DANA,

SILLIMAN PROFESSOR OF GEOLOGY AND MINERALOGY IN YALE COLLEGE. AUTHOR OF A MANUAL OF GEOLOGY; OF REPORTS OF WILKES'S U. S. EXPLORING EXPEDITION ON GEOLOGY; ON ZOOPHYTES; AND ON CRUSTACEA, ETC.

AIDED BY

GEORGE JARVIS BRUSH,

PROFESSOR OF MINERALOGY AND METALLURGY IN THE SHEFFIELD SCIENTIFIC SCHOOL OF YALE COLLEGE.

"*Hac studia nobiscum peregrinantur....rusticantur.*"



FIFTH EDITION.

REWRITTEN AND ENLARGED, AND ILLUSTRATED WITH UPWARDS OF SIX HUNDRED WOODCUTS.

NEW YORK:
JOHN WILEY & SON, PUBLISHERS,
NO. 2 CLINTON PLACE.

1868.

114. FREIESLEBENITE. Mine d'antimoine grise tenant argent (fr. Himmelsfürst) de Lisle, Descr. de Min., 35, 1773, Crist., iii. 54, 1783. Dunkles Weissgültigerz (id. loc., known since 1720) Klapr., Beitr., i. 173, 1795. Schilf-Glaserz Freiesleben, Geogn. Arb., vi. 97, 1817. Antimonial Sulphuret of Silver, Sulphuret of Silver and Antimony. Argent sulfuré antimonifère et cuprifère Levy, Descr. Min. Heuland, 1838. Donacargyrite Chapm., Min., 128, 1843. Freieslebenite Haid., 569, 1845.

Monoclinic. $C=87^\circ 46'$, $I \wedge I=119^\circ 12'$, $O \wedge 1-i=137^\circ 10'$ (B. & M.); $a:b:c=1.5802:1:1.7032$. Observed planes: O ; vertical, $I, i-i, i-i, i-\frac{4}{3}$, $i-\frac{3}{2}, i-\frac{2}{3}, i-\frac{5}{3}, i-\frac{2}{3}$; domes, $1-i, \frac{1}{2}-i, 1-i, \frac{3}{2}-i, 2-i$; octahedral, $\frac{1}{2}, 1, 1-4, 1-2, \frac{3}{2}-3$.

$O \wedge 1-i=123^\circ 55'$	$1-\frac{2}{} \wedge 1-\frac{2}{} \text{, front, } =152^\circ 36'$	109
$O \wedge \frac{1}{2}-i=156 8$	$i-\frac{4}{3} \wedge i-\frac{4}{3} \text{ " } =132 48$	
$O \wedge 2-i=118 21$	$i-\frac{3}{2} \wedge i-\frac{3}{2} \text{ " } =157 54$	
$1 \wedge 1, \text{ front, } =128 2$	$1-i \wedge 1-i, \text{ top, } =94 20$	
$1-4 \wedge 1-4 \text{ " } =166 6$		

Prisms longitudinally striated. Cleavage: I perfect. $H.=2-2.5$. $G.=6-6.4$; 6.194, Hausmann; 6.23, fr. Przibram, v. Payr. Lustre metallic. Color and streak light steel-gray, inclining to silver-white, also blackish lead-gray. Yields easily to the knife, and is rather brittle. Fracture subconchoidal—uneven.

Comp.—5 (Pb, Ag) S + 2 Sb² S³ (fr. v. Payr's anal.) =, if Ag : Pb = 3 : 4, Sulphur 18.6, antimony 25.9, lead 31.2, silver 24.3 = 100. Analyses: 1, 2, Wöhler (Pogg., xlvi. 146); 3, Escosura (Rev. Minera, vi. 358, Ann. d. M., V. viii. 495); 4, v. Payr (Jahrb. Min. 1860, 579):

	S	Sb	Pb	Ag	Fe	Cu
1.	18.77	27.72	30.00	22.18	0.11	1.62 = 100 W.
2.	18.72	27.05	30.08	23.78	—	= 99.60 W.
3. Spain	17.60	26.83	31.90	22.45	—	= 98.78 Escosura.
4. Przibram	18.41	27.11	30.77	23.08	0.63	= 100 Payr.

Pisani refers here the massive dark *weissgültigerz* analyzed by Klaproth, who obtained (l. c.) S 22.00, Sb 21.50, Pb 41.00, Ag 9.25, Fe 1.75, Al 1.00, Si 0.75 = 97.25, considering part of the silver as here replaced by lead.

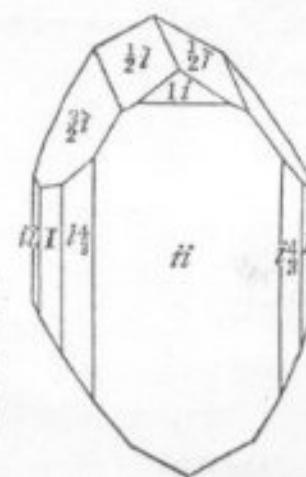
Pyr.—In the open tube gives sulphurous and antimonial fumes, the latter condensing as a white sublimate. B.B. on charcoal fuses easily, giving a coating, on the outer edge white, from antimonous acid, and near the assay yellow, from oxyd of lead; continued blowing leaves a globule of silver.

Obs.—With argentite, siderite, and galenite, in the Himmelsfürst mine, at Freiberg in Saxony, and Kapnik in Transylvania; at Ratiaboritz, the ore of which locality contains bismuth, according to Zincken; at Przibram in crystals, often twins, and 2 to 6 lines long; at Felsobanya; at Hiendelencia in Spain, with argentite, red silver, siderite, galenite, etc.

The crystals from Himmelsfürst are *triclinic*, according to Breithaupt (B. H. Ztg., xxv. 189). Chapman took his name *donacargyrite* from the British Museum, knowing nothing of its origin. Such a name ought not to displace *freieslebenite*.

115. PYROSTILPNITE. Feuerblende Breith., Char., 285, 333, 1832. Fireblende Dana, Min., 543, 1850. Pyrostilpnite, Dana.

Monoclinic. In delicate crystals grouped like stilbite. Observed planes, $I, i-i, 1-\frac{2}{3}, 1-i, 2-i$, B. & M.



$$I \wedge I = 139^\circ 12'. \quad 2-i \wedge 2-i, \text{ top,} = 74^\circ. \quad i-i \wedge 1-i = 123^\circ 34'. \\ 1-i \wedge 1-i, \text{ top,} = 112^\circ 52'. \quad i-i \wedge 2-i = 148^\circ 42'. \quad 1-\frac{1}{2} \wedge 1-\frac{1}{2}, \text{ top,} = 62^\circ 36'.$$

Cleavage: $i\bar{i}$, and crystals flattened in this direction. Faces $i\bar{i}$ striated parallel to the clinodiagonal. Twins: plane of composition $i\bar{i}$ (orthodiagonal).

H.=2. G.=4·2-4·25. Lustre pearly-adamantine. Color hyacinth-red. Translucent. Sectile and somewhat flexible.

Comp.—Contains 62.3 per cent. of silver, along with sulphur and antimony (Plattner, *l. c.*, 333).
Pyr.—Like pyrargyrite.

Pyr.—Like pyrrhotite.
Obs.—From the Kurprin

Obs.—From the Kurprinz mine near Freiberg; Andreasberg; Przibram. Named from *-itis*, fire, and *-chrysos*, shining, in allusion to its fire-like color.

Named from πῦρ, *fire*, and στιλπνός, *shining*, in allusion to its fire-like color.

116. RITTINGERITE. Rittingerit Zippe, Ber. Ak. Wien, ix. 2, 345, 1852.

Monoclinic; $C=88^\circ 26'$. In small rhombic tables with replaced basal edges. Observed planes: $O, \frac{1}{2}, I, \pm 6, \pm 1$. Observed angles: $O \wedge I = 91^\circ 24'$, $I \wedge I = 126^\circ 18'$, $O \wedge 1 = 132^\circ 24'$, $O \wedge -1 = 130^\circ 50'$, $1 \wedge -1 = 96^\circ 20'$, $O \wedge -6 = 98^\circ 30'$, $O \wedge \frac{1}{2} = 150^\circ$, $-1 \wedge -1 = 140^\circ 1'$. Cleavage: O imperfect.

H.=1·5-3. Lustre submetallic-adamantine. Plane O blackish-brown in the larger crystals, less dark in the more minute; other parts iron-black. Translucent and dull honey-yellow to hyacinth-red in the direction of the axis. Streak orange-yellow. Brittle.

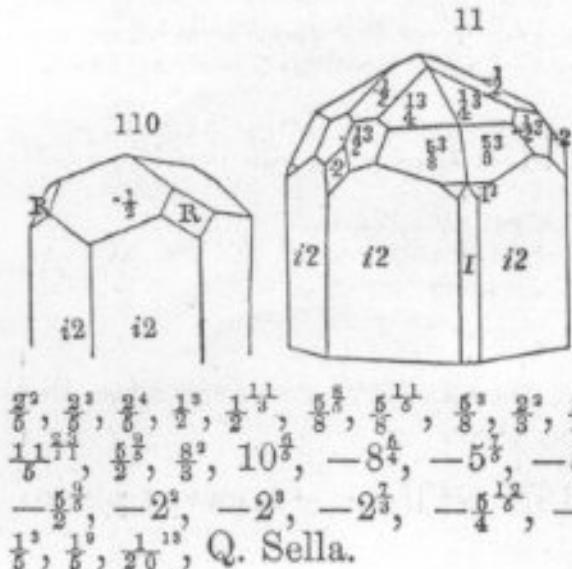
Comp.—Probably a compound of sulphid of silver and antimony.

Pyr.—B.B. same as with pyrargyrite; fuses very easily, gives an arsenical odor, and finally a globule of pure silver.

Obs.—From Joachimsthal, in small crystals.

117. PYRARGYRITE. Argentum rude rubrum pt. *Germ. Rothgolderz. Agric.*, 362. Internr.

462, 1546. Argentum rubri coloris pt., Gemein Rothguldenerz, *Gesner.*, *Foss.*, 62, 1565. Roth-gylden pt., Argentum arsenico paucō sulphure et ferro mineralisatum pt., Minera argenti rubra var. opaca, var. nigrescens, *Wall.*, 310, 1747. Mine d'argent rouge *Fr. Trl.* *Wall.*, 1753. Ruby Silver Ore pt., Red Silver Ore pt., *Hill*, *Foss.*, 1771. Dunkles Rothgültigerz, Lichtes id. pt., *Wern.*, 1789. Dark Red Silver Ore; Antimonial Red Silver. Argent antimonié sulfuré pt. *H.*, *Tr.*, 1801. Argent rouge antimoniale *Proust.*, *J. de Phys.*, lix. 407, 1804. Ærosit *Selb*, *Denks.* *Nat. Schwab.*, i. 311, *Tasch. Min.*, 401, 1817. Rubinblende pt. *Mohs.* Antimonsilberblende. Pyrargrit *Glock.*, *Handb.*, 388, 1831. Argyrythrose *Beud.*, *Tr.*, ii. 430, 1832.



Rhombohedral. Opposite extremities of crystals often unlike. $R \wedge R = 108^\circ 42'$, B. & M., $O \wedge R = 137^\circ 42'$; $a = 0.788$. Observed planes in this and the following species: basal and prismatic, $O, I, i\cdot2, i\cdot\frac{3}{2}, i\cdot\frac{5}{4}, i\cdot\frac{2}{3}\cdot\frac{5}{3}$; rhombohedral, $\frac{1}{4}, \frac{1}{2}, \frac{7}{10}, \frac{5}{8}, R$ (or 1), $\frac{1}{2}, 4, -14, -5, -\frac{7}{2}, -2, -\frac{3}{2}, -1, -\frac{1}{2}, -\frac{1}{3}, -\frac{1}{6}$; pyramidal, $\frac{2}{3}\cdot2, \frac{4}{3}\cdot2, ;$ scaleno-hedral, $\frac{1}{4}^5, \frac{1}{5}^6, \frac{1}{6}^7, \frac{1}{4}^3, \frac{1}{4}^4, \frac{1}{4}^7, \frac{5}{14}^8, \frac{1}{8}^9, \frac{1}{8}^{\frac{1}{3}\cdot7}, \frac{1}{13}^{\frac{5}{2}}, \frac{1}{12}^{\frac{1}{3}}, 1^{\frac{4}{3}}, 1^{\frac{5}{3}}, 1^{\frac{7}{3}}, 1^{\frac{1}{2}}, 1^4, 1^6, 1^{\frac{1}{3}\cdot7}, 1^{\frac{1}{8}}, 1^7, 1^{\frac{1}{8}\cdot7}, 2^5, 5^{\frac{1}{10}}, -5^{\frac{1}{6}}, -5^{\frac{1}{8}}, -4^{\frac{3}{2}}, -\frac{7}{2}^{\frac{1}{4}}, -\frac{2}{7}^4, -\frac{11}{4}^{\frac{1}{2}}, -1^{\frac{1}{3}}, -\frac{4}{6}^3, -\frac{2}{7}^2 - \frac{1}{3}^{\frac{1}{3}\cdot1}, -\frac{1}{2}^2, -\frac{1}{2}^3, -\frac{1}{2}^{\frac{1}{6}\cdot1}, -\frac{1}{3}^{\frac{5}{2}}$.