Cornetite $Cu_3(PO_4)(OH)_3$

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. As crystals, short prismatic on [001], {210} rounded, also showing large {021}, {221}, with a number of other forms known, to 1 cm; as flat radial aggregates and crusts. *Twinning:* On {*h*0*l*}.

Physical Properties: Hardness = ∼4.5 D(meas.) = 4.10 D(calc.) = 4.14

Optical Properties: Transparent to translucent. *Color:* Deep blue, peacock-blue, pale blue to greenish blue; in transmitted light, greenish blue, may be zoned. *Luster:* Vitreous.
Optical Class: Biaxial (–). *Orientation:* $X = b$; $Y = a$; $Z = c$. *Dispersion:* $r < v$, strong.
$\alpha = 1.744$–1.765 $\beta = 1.81$–1.832 $\gamma = 1.82$–1.848 2V(meas.) = 24°–33° 2V(calc.) = 23°45′

Cell Data: *Space Group: Pbca.* $a = 10.854(1)$ $b = 14.053(3)$ $c = 7.086(2)$ $Z = 8$

X-ray Powder Pattern: Bwana Mkubwa, Zambia.
3.04 (10), 4.29 (9), 3.17 (8), 3.68 (7), 2.06 (7), 5.07 (6), 5.48 (5)

Chemistry:

	(1)	(2)
P_2O_5	19.81	21.08
CuO	70.78	70.89
H_2O	9.41	8.03
Total	[100.00]	100.00

(1) Bwana Mkubwa, Zambia; recalculated after deduction of Fe_2O_3 0.53% and insoluble 4.03%.
(2) $Cu_3(PO_4)(OH)_3$.

Occurrence: A rare secondary mineral in the oxidized zone of some hydrothermal copper deposits.

Association: Copper, brochantite, pseudomalachite, libethenite, malachite, atacamite, chrysocolla, heterogenite.

Distribution: From the Star of the Congo mine, near Lubumbashi, and at the Kalabi and Lukini mines, Katanga Province, Congo (Shaba Province, Zaire). From the Bwana Mkubwa mine, Ndola, and Kansanshi, Zambia. At the Alaska, Mangula, and Molly mines, Lomagundi district, Zimbabwe. In the USA, in the Blue Jay and Empire-Nevada mines, Yerington district, Lyon Co., Nevada; at Tyrone, Santa Rita, Grant Co., New Mexico; on Saginaw Hill, Pima Co., Arizona. From Cerro Verde, Sonora, Mexico. In Chile, at Chuquicamata, Antofagasta; the Manto Ruso mine, about 85 km north of Copiapó, Atacama; and the Brillador mine, La Serena, near Coquimbo. From the Blockade mine, 60 km east of Mount Isa, and at Ravenswood, Queensland, Australia.

Name: To honor Jules Cornet (1865–1929), Belgian geologist.

Type Material: University of Liège, Liège, Belgium, 9.130 and 9.133.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 789–791. (2) Berry, L.G. (1950) On pseudomalachite and cornetite. Amer. Mineral., 35, 365–385. (3) Khin, B. (1979) Cornetite from Saginaw Hill, Arizona. Mineral. Record, 1, 117 and Mineral. Record, 2, 47. (4) Eby, R.K. and F.C. Hawthorne (1989) Cornetite: modulated densely-packed Cu^{2+} oxysalt. Mineral. Petrol., 40, 127–136.