Twins of Marcasite in regular disposition upon Cubes of Pyrites.

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THE subject of this note derives interest less from its novelty than from the beautiful manner in which the intergrowth is exemplified in Nature. As Sadebeck[1] has shown, the intergrowth of marcasite and pyrites takes place according to two laws.

(1) The vertical axis of marcasite is parallel with a principal axis of pyrites; one of the two other principal axes of the latter being parallel with the combination edge *m* (110) ∞P : *c* (001) 0*P* of the former; or, in other words, the vertical and one lateral axis (*ab*) of marcasite coincide with two principal axes of pyrites.

(2) The vertical axis of marcasite is parallel with a principal axis of pyrites; the brachydiagonal axis is parallel with a diagonal axis of pyrites.

The first law appears to be the more general, and Sadebeck describes intergrowths where cubes of pyrites are disposed on marcasite, and also where twins of marcasite are disposed upon the cubical faces of pyrites, the twin planes of the former being parallel with the three faces of the cube. (See his Fig. 6, Pl. X.)

The present instance seems to be a more perfect development of the one observed by Sadebeck on crystals from Freiberg; it occurs on a specimen from Bredlar, near Brilon, in Westphalia, consisting of red iron ore upon the drusy surface of which marcasite crystals, together with a lesser number of cubes of pyrites, are dispersed.

The faces of the cubes of pyrites are deeply striated and curved by an indeterminable pentagonal dodecahedron, and the solid angles are occasionally replaced by minute octahedral faces. The marcasite crystals exhibit the forms :—

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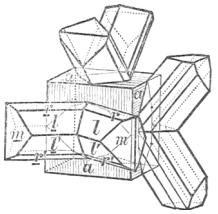
[1] *Ueber die Krystallisation des Markasits und seine regelmässigen Verwachsungen mit Eisenkies, von A. Sadebeck, Ann. d. Phys. u. Chem. Erg. Bd.* 8, 625, 1878 (*Abstract : Zeitschr. f. Kryst.* 3, 626, 1879).



m	110	∞P
l	101	$\breve{P}\infty$
r	104	$\frac{1}{4}\breve{P}\infty$

and are frequently twinned according to the law: twin plane and composition face m (110) ∞P: forming contact twins. All the faces are very much curved and horizontally striated, and are not adapted for exact measurement. The form r, which gradually curves into l, was determined by approximate measurement,

$$r\,r'\ (\text{over } c) = 34°19'\ \text{calc. } 33°0'$$

The disposition of the marcasite crystals upon the cubes of pyrites is such that each face of the cube carries a twin of marcasite by the above law of twinning, and according to Sadebeck's first law of intergrowth, in such a manner that the twin plane is perpendicular to the face of the cube and parallel with the striations upon its surface; thus, the outer prism faces (m) of each marcasite twin are parallel with the adjoining cubical faces, which are striated in the same direction as the prism faces, and the three composition faces of the twins are perpendicular to one another and correspond with the principal axial planes of the cube.

The accompanying figure, in parallel projection, is drawn as closely as possible from nature, and exhibits the marcasite twins, all of the same size, upon the three visible faces of the cube. The form r (104) $\frac{1}{4}\breve{P}\infty$ is however replaced in the drawing by the more frequently occurring form (103) $\frac{1}{3}\breve{P}\infty$.