These equations are closely similar to those for isometric crystals. The values of φ are independent of p_0; they may be found therefore from the table on page 25 of the Winkeltabellen, directly. The values of ρ differ only in requiring to be multiplied by p_0. They may therefore be derived from the tables of page 22. For example, to find the angles of the face (121), 1 2, of vesuvianite, for which $p_0 = 0.5376$:

From table, page 25, $\varphi = 26°34'$

From table, page 22, $\tan \rho = p_0\sqrt{1^2 + 2^2}$; $\log \cdot \tan \rho = \log p_0 + \log \sqrt{5}$.

$$\text{Log } p_0 = 9.73046$$
$$\text{Log } \sqrt{5} = \underline{0.34948}$$
$$\text{Log tan } \rho = 0.07994 \quad \rho = 50°15'.$$

For an example of the complete calculation of a tetragonal crystal see V. Goldschmidt, Phosgenit von Monteponi, *Z. Kryst. Min.*, **21**, 321, 1893.

TETRAGONAL SYSTEM. PHOSGENITE FROM TSUMEB, AMBO-LAND, SOUTHWEST AFRICA

Heidelberg and Toronto

V. GOLDSCHMIDT AND E. THOMSON

As far as we can ascertain, phosgenite has not been mentioned heretofore as coming from Tsumeb. On that account it would seem to be of interest to describe this occurrence briefly. The crystals used were obtained from the Heidelberger Mineralien Comptoir (Fr. Rodrian), Heidelberg, Germany. They are crystals of considerable size, smoke-brown in color, fresh, and with a brilliant luster. They show good basal cleavage. In appearance they are similar to those from Monteponi. Trapezohedral hemihedrism could not be established in the few crystals which were at our disposal. It seems likely, however, that among the cerussites and anglesites from Tsumeb many phosgenites lie hidden, and it is possible that more abundant material will bring out this hemihedrism.

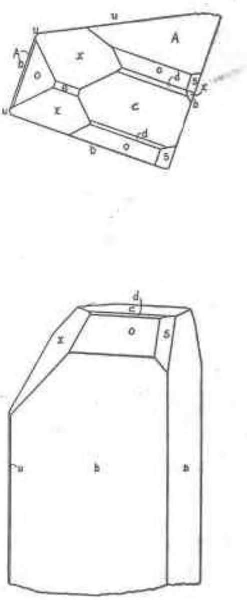

FIG. 26.

Two crystals were measured. These showed the forms c = 0(001), b = 0∞(010), u = ∞2(120), e = 01(011), o = 02(021), x = 1(111), s = 12(121), d = $0\frac{1}{3}$(013), and A^* = 04(041). The element was determined afresh. This determination, from nine faces, gave an average value for $p_0 = c = 1.0883$, which is in close agreement with that of the Monteponi crystals, which show $p_0 = c = 1.0889$.[1]

Crystal 1 is represented in Fig. 26, as closely as possible in its natural development, in plan and perspective. The dimensions of this crystal are 10 × 10 × 45 mm. Crystal 2 has the dimensions 5 × 10 × 15 mm. Both crystals show the same combination of faces, as well as the same arrangement of the faces in the order of magnitude. The forms b, c, x, and o are the most prominent ones, while d and A are subordinate.

The form A = 04 (041) is a new form. It was found on crystal 1 and shows two faces on that crystal, which yielded the following angles:

	Symbol	φ	ρ
Measured	A	180° 01′ 270° 02′	77° 15′ 77° 20′
Calculated	A	180° 00′ 270° 00′	77° 06′ 77° 06′

The form is thus verified.

LISTS OF THE TETRAGONAL MINERALS INCLUDED IN GOLDSCHMIDT'S WINKELTABELLEN. EDGAR T. WHERRY. *Washington, D. C.*—The tetragonal minerals included in the Winkeltabellen are here arranged in the order of increasing value of $p_0(= c)$. This arrangement may be useful for determinative purposes:—measurement of p_0 on an unknown crystal will enable it to be placed in a certain position in the series, and its identity with one of the minerals falling near that position can usually be readily established. In case the form taken as first order in measuring the unknown happens to have been taken as second order in calculating the angle-table, however, the value of p_0 obtained will have to be divided (or multiplied) by $\frac{1}{2}\sqrt{2}$ in order to place the unknown. For instance, suppose an unknown crystal, actually chalcopyrite, were measured in Dana's orientation, it would show $p_0 = 0.98\pm$; search in the table would show near this value only edingtonite and arksutite, with neither of which the unknown would agree in physical features. On dividing the value obtained by 0.7071, however, the result would be $1.38\pm$; and on looking at the corresponding portion of the table, chalcopyrite would soon be located.

Supplementary lists give the tetragonal minerals which have been found to show diminished symmetry.

[1] V. Goldschmidt. Z. *Kryst. Min.*, **21**, 327, 1893; **23**, 147, 1894; *Winkeltabellen*, 265, 1897.