Orpiment.

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THE crystalline form of orpiment was first determined by Mohs (*Grundriss der Mineralogie* (1824), 2, 613).

His measurements, which he is careful to state were only approximate, gave an angle of 79°20′ for the prism, and 83°37′ for the brachydome; the plane of perfect cleavage being taken as the macropinakoid, and the crystals being referred to the orthorhombic system.

The observations of Mohs were made upon crystals from Tajowa, but these, like the orpiment from other localities, are very uneven and have rounded faces.

Breithaupt on the other hand, from his own observations, supposed the mineral to be mono-symmetric. (*Berg-und Hüttenmännische Zeitung* 25 (1866), 194.)

Krenner has subsequently measured crystals from Bosnia, and found for the prism angle 77°14′, and for the angle of the dome 82°34′.

(*Földtani Közlöny* 13 (1883), 269, 381, and 14 (1884), 107.)

Nothing has hitherto been recorded concerning the optical characters of the mineral; the crystals are not sufficiently transparent, they are too soft to afford artificial sections, while the cleavage laminae are very flexible and do not show any interference figure.

Considerable interest is attached to any indications of the symmetry of orpiment which may be supplied by its optical characters; firstly, because the goniometrical measurements are not good; secondly, because, although the other sulphides of the same isomorphous group are opaque, Drude's experiments on the reflection of light at its cleavage surface indicate that stibnite may possess the symmetry of the mono-symmetric, and not of the orthorhombic system. (*Ann. d. Phys.* 34 (1888), 489.)

At Tajowa, near Neusohl, in Hungary, where the best available crystals are found, the orpiment occurs as nodules and isolated crystals in clay or in a calcareous marl. The larger crystals, which are probably those

hitherto used for goniometrical measurements, are very uneven, and have curved faces especially in the zone which contains the cleavage face and the pyramids.

This marl sometimes contains minute crystals disseminated through its mass, and when it is dissolved in hydrochloric acid the clayey residue is found to contain numerous microscopic prisms of orpiment.

In this way it is possible to extract from the marl the most beautiful little crystals, which not only have sharply defined edges, but are nearly transparent; they present a combination of the prism with the brachydome.

When examined under the microscope the prism faces are found to give a straight extinction, and through each emerges nearly normally an optic axis showing a very marked dispersion; through each pair of prism faces the optic axis is inclined at about 4° to the normal. This result is in complete accordance with the requirements of the orthorhombic system, and shows that the basal plane is the plane of the optic axes, the brachydiagonal is the acute bisectrix, and the true axial angle is very nearly equal to that of the prism faces.

The dispersion, moreover, is very strong; $\rho > v$.

Measurements made upon the best available crystal gave the following results.

Prism angle = 79°27′.

Angle between the optic axes as they emerge in air through the prism faces = 70°24′ for sodium light (line D).

For the line C this angle is about	...	...	76½°
For the line E ,, ,,	...	...	66½°

Attempts to measure the obtuse axial angle in oil through a cleavage flake were not successful.