

CO-AXIAL QUARTZ TWIN CRYSTALS WITH RADIATE CONCRESCENCE IN THE DEPOSIT OCNA-DE-FIER, BANAT, RUMANIA

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In the paper a new sort of quartz twin crystal is reported, which has been recently discovered in the Reichenstein body of the mineralized complex of the classical iron deposit Ocna-de-Fier (Banat, Rumania).

The classical contact deposit at Ocna-de-Fier has been known from ancient times. A more detailed description has been given in the XVIIIth century by C. DELIUS [1738], I. V. BORN [1774], afterwards B. V. COTTA [1864] and later AL. CODARCEA [1931], A. KISSLING [1967] and SERBAN VLAD [1974].

The deposit is located on the geotectonical alignment bearing of Western-Banat, in the contact zones of the Mesozoic geosyncline Ocna-de-Fier — Calina with the Banat magmatites.

The complex mineralization of the deposit is composed of more than 100 ores and scarn minerals some of which — e.g. the ludwigite and the dognacskaite as well as others — are famous throughout the world. They have been described and located for the first time in this deposit.

Quartz is of major importance among the minerals quoted, including the catathermal Japanese twin crystals and the recently identified twin crystals to be described in this paper.

During the mining operations of the deposit in the Reichenstein I—heading, Delius-zone of the Ocna-de-Fier mine, a geode was found including several quartz crystal aggregations of unusual shape.

The geode is located in the upper zone of the deposit, at the boundary between crystalline limestone and garnetiferous scarns, about 3 m/150 m in size, with North-South orientation the crystalline limestone in the Western wall of the geode is granoblastic, grain size up to 1.5 mm.

The scarn in the Eastern wall of the geode is granular, massive; due to the garnet of the grossularite = andradite series its colour is generally yellowish-brown. In some places greyish-green spots are noted, consisting of short prisms up to 0.5 cm in length, sometimes in divergent arrangement; most probably it is a diopside partially passing to tremolite.

In more distant locations of the geode, the scarn consists of a mineralization composed of magnetite in shape of strips of millimetre thickness alternating with scarn strips.

To note that the geode is lined mainly with well developed crystals representing a quartz pseudomorph after apatite, pyroxene and less calcite (*Fig. 1*).



Fig. 1. Well-developed quartz crystals pseudomorph after apatite, pyroxene and less calcite. Natural size.

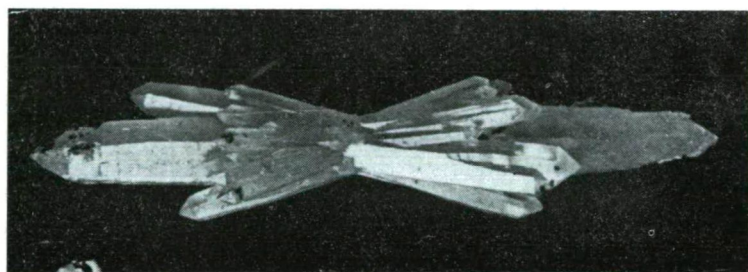


Fig. 2. Interpenetration of two co-axial quartz twin crystals, the angle amounts to 43° . Natural size.

In addition to quartz crystallized in shape of the white and translucent pseudomorphs cited, another series of well developed quartz crystals occurs in lesser amounts and of more transparent appearance; the garnet crystals are rhombicododecahedrons as well as in lesser amount, trapezohedrons.

The crystals are situated on a limonitic hematite crust up to 0.8 cm in thickness.

The centre of the geode was filled with a reddishbrown clayey material. In this plastic mass perfectly developed quartz crystals were found. A number of these, of small size, were attached to more or less undulating platelets composed of idiomorphous crystals nearly equal in size, amounting in the main to 3—4 mm. Other quartz crystals were found perfectly developed in the clayey mass.

The particular novelty to be reported, especially with unfixated crystals, has been the existence of a "co-axial quartz twin crystal with radiate concrescences".

Three different types of twins can be distinguished by starting from the simple to the complex:

1) A co-axial twin crystal where the individuals of smaller size — 2—4 cm — show radiate twinning about a single individual, the axis of symmetry A.6, the length of which much exceeds that of the other individuals in radiate arrangement and making a 20° angle (*Fig. 2*).

2) Interpenetration of a couple of co-axial twin crystals, the angle subtended by interpenetration amounting to 43° (*Fig. 3*).

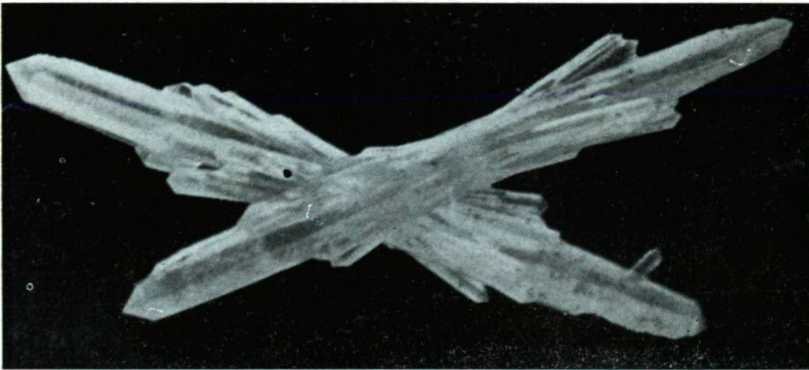


Fig. 3. Twin consisting of three individuals. Natural size.

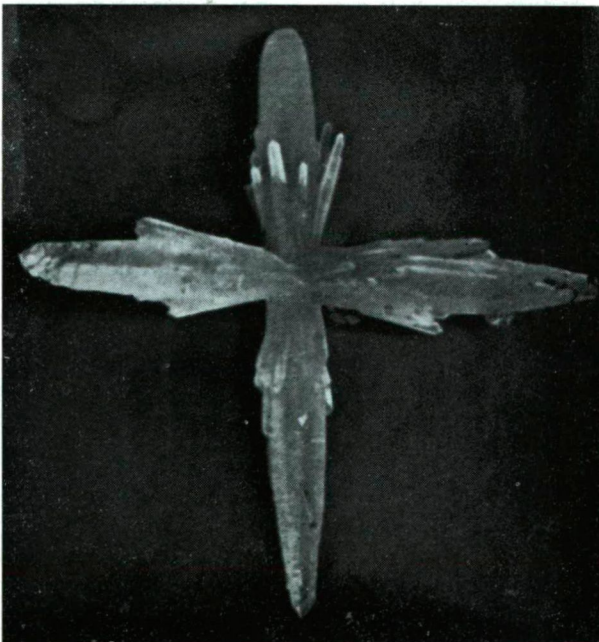


Fig. 4. Quartz twin crystals. 2/3 natural size.

3) Twinning of three individuals as follows:

On one hand, twinning of each of the individuals is coaxial and radiate. Two of the individuals, of more elongated shape, interpenetrate by subtending a 90° angle, while the plane they subtend, interpenetrates with the third individual making a 20° angle.

On the whole, the above described triple twinning is in shape of a cross with nearly equal arms (*Fig. 4*).

To note that the 20° angle of twinning, in case of the third kind of twinning described, is equal to the 20° angle of co-axial twinning with radiate concrescence.

Of the crystal faces, the prism $10\bar{1}0$ faces are best developed on all individuals.

To note that onto some of the quartz crystals, black calcite crystals are grafted, the faces of which are striated; the size of the trigonal scalenohedrons of calcite crystals varies between 1 to 13 cm (*Fig. 5*).

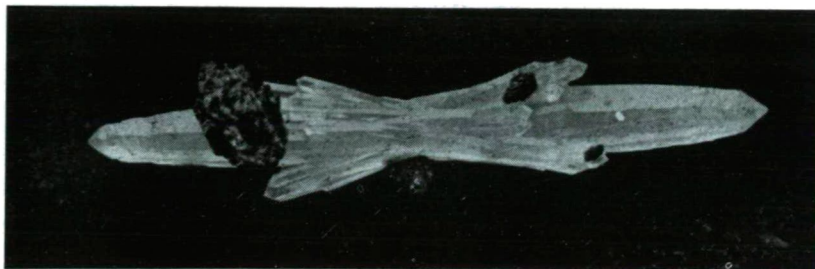


Fig. 5. Quartz twin. Natural size.

The quartz crystals are nearly transparent.

The paper is the first in Rumania to report identification of a new kind of co-axial twinning discovered by the author in the Reichenstein body of the classical contact deposit at Ocna-de-Fier in Banat.

The twin crystal type described is characterized by co-axial twinning according to the A6-axis of the bigger individuals, while the smaller individuals are radially arranged to the first, subtending an angle of 20° .

There are cases of interpenetration of 2 or 3 individuals with co-axial mode of twinning; however, in those cases too, crystals of smaller size in radiate arrangement are found.

The crystallographic measurements have been carried out in the Institute for Oil, Gas and Technical Geology, Bucharest, by PROFESSOR ANA MERCUS.

Manuscript received, August 10, 1975

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