

these two groups. Further structural work on "Povlen-type" clinochryso-
tite as well as on 6-layer orthoserpentine, which occurs closely associated
in many Yugoslavian localities, is now in progress in our laboratory.

REFERENCES

- ARUJA, E. (1954) *Mineral. Mag.* **27**, 65-74.
BATES, T. F. (1959) *Am. Mineral.* **44**, 78-114.
HESS, H. H., G. DENGGO AND R. J. SMITH (1952) *Am. Mineral.* **37**, 68-74.
NAGY, B. (1953) *Econ. Geol.* **48**, 591.
ROY, D. M. AND R. ROY (1954) *Am. Mineral.* **39**, 957-975.
WHITTAKER, E. J. W. (1951) *Acta Cryst.* **4**, 187.
——— (1953) *Acta Cryst.* **6**, 93.
——— (1953) *Acta Cryst.* **6**, 747-748.
——— (1955) *Acta Cryst.* **7**, 827-832.
——— (1956) *Acta Cryst.* **9**, 855-861.
——— AND J. ZUSSMAN (1956) *Mineral. Mag.* **31**, 107-126.
ZUSSMAN, J. (1954) *Mineral. Mag.* **30**, 498-512.
——— G. W. BRINDLEY AND J. J. COMMER (1957) *Am. Mineral.* **42**, 133-153.

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GROWTH SPIRALS ON PRISM FACES OF CULTURED QUARTZ

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Employing precision optical techniques, we have examined micro-
structures on faces of about seventy crystals of cultured quartz. We were
interested in examining remarkably plane surfaces, with an expectation
of growth spirals on them, which might throw light on understanding the
mechanism of growth of such crystals. Spirals are seldom observed on
prism faces of cultured quartz, and as far as we know there is no report
of growth spirals on them.

We have recently obtained several specimens of cultured quartz of
electronic grade, synthesized by overseas manufacturers. We have ob-
served a variety of growth spirals on a number of prism faces of several
synthetic crystals. Figure 1 shows a region of a prism face on which a
number of spirals appear. Here AB represents the m-R edge. Of all the
spirals observed on different prism faces, the longer arms are found to be
strictly oriented at 60° to the m-R edge. Figure 2 is a positive phase
contrast photomicrograph which illustrates a growth spiral at a higher
magnification. Several such single spirals have been observed. Besides
these, spirals of opposite sign have also been observed, one such case
being shown in Fig. 3 which is a positive phase contrast photomicro-

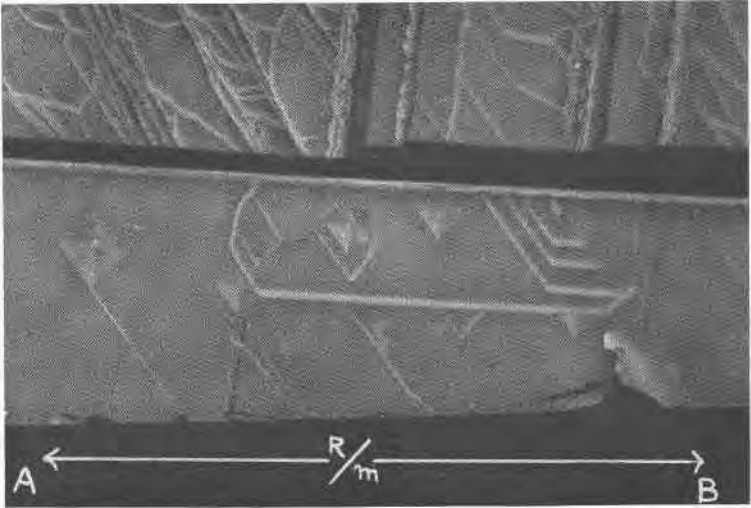
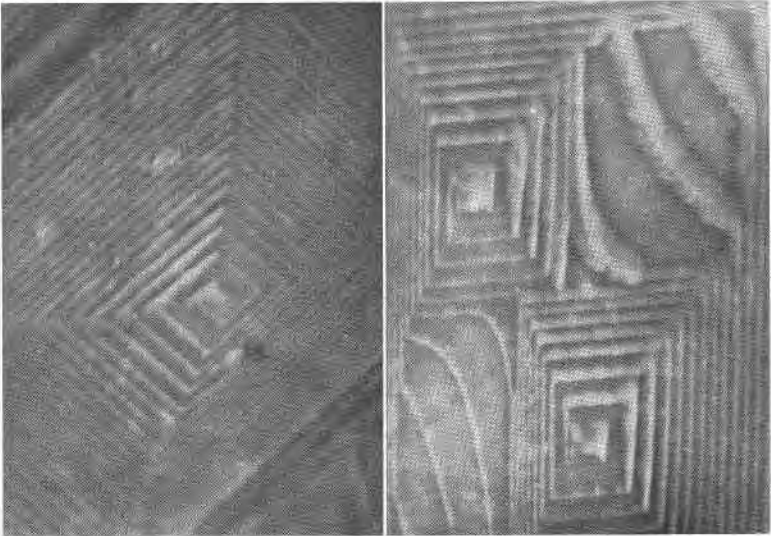


FIG. 1. Prism face showing several spirals ($\times 108$).



(2)

(3)

FIG. 2. Positive phase contrast picture showing a single spiral at a higher magnification ($\times 1100$).

FIG. 3. Positive phase contrast photomicrograph illustrating spirals of opposite sign ($\times 1100$).

graph. From the position of the white diffraction bands in Figs. 2 and 3 we can safely say that these are growth spiral hillocks.

Observations of such spirals and associated features throw a good deal of light on the mechanism of growth of cultured quartz crystals in general and of prism faces of such crystals in particular. A detailed report in this connection will be communicated elsewhere.

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