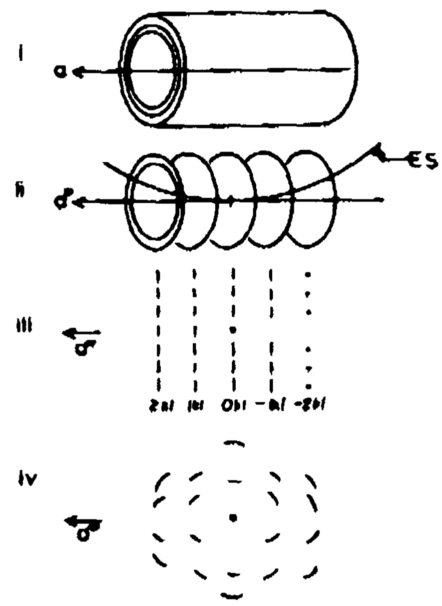

FIG. 2. Illustration of the real and reciprocal lattice of a defect-free chrysotile fiber (i) and (ii) idealized as a series of concentric cylinders. The actual structure is a defected spiral sheet (Yada, 1967). The reciprocal lattice of the ideal fiber is then a series of equispaced concentric rings along the a^* axis, as in the 2kl layer; when these rings intersect, the Ewald sphere (ES) spots ought to be produced as shown on the -2kl layer line. However, streaks are observed (Yada, 1967), arising probably from the spiral shape of the fiber defects and strains formed during the scrolling process. When a fiber bundle (fibers of different orientations) is imaged, the layer lines are smeared out, yielding a typical "arcuate" pattern as in Fig. 3b.

growth of the crystal. The influence of these faults on the diffraction patterns and their influence on deformation needs further study.

When bundles of fibers are involved, the streaks are replaced by arcs (Figs. 2iv and 3b), showing a strong tendency toward a texture and yielding the typical "arcuate" patterns observed by several researchers (e.g., Rohl *et al.*, 1976). The dark-field image obtained by imaging any part of the arc, as shown in Figs. 1 and 3b, should yield uniform intensity, *if* the crystal is homogeneous. This is the case to be expected *only* in the case of the undeformed fibers—and is consistent with the experimental observations in Figs. 3a and 3b.

RESULTS

Bright- and dark-field images of naturally occurring chrysotile (A) are shown in Fig. 3. The dark field is obtained by imaging a portion of the diffracted intensity, as explained above. The result is a uniform contrast, as would be expected from an undeformed crystal.

The striking feature of the dark-field images is the great intensity along the hollow canals and this needs further investigation. The intensity difference cannot be explained on the basis of differences in absorption alone; it appears that some