TABLE 2

Orientation of cylinders	Experiment number	Orientations of faults
$\parallel c$	753	r_1, r_2, z_1, z_2, z_3
$\parallel c$	755	$r_1, r_2, r_3, z_1, z_2, z_3$
$\parallel c$	781	$z_1, r_2, z_3, r_3, r_1, z_3$
$\parallel c$	782	z_1, z_2, r_2, (0001)
$\perp r$	749	**(0001)**, z_2, z_3
$\perp r$	750	**(0001)**, z_2, z_3
$\perp r$	761	**(0001)**, z_2, z_3, r_1, r_2
$\perp r$	785	**(0001)**, z_2, z_3
$\perp r$	786	**(0001)**, z_2, z_3
$\perp r$	787	**(0001)**, z_2, z_3
$\perp z$	754	**(0001)** —
$\perp z$	759	**(0001)**, r_2, r_3, m_1
$\perp m$	756	$\mathbf{r}_3, \mathbf{z}_3, z_1, z_2, r_2$
$\perp m$	758	$\mathbf{r}_2, \mathbf{z}_2, z_1, z_2, r_1, r_2$
$\perp m$	784	z_1, r_2, r_3
$\perp m$	788	z_2, r_2, z_3, z_1, (0001)
$\perp m$	790	r_1, r_2, z_2, z_3, (0001)
A	762	$\mathbf{z}_3, z_2, r_1, r_3, m_1, m_3$
A	763	$\mathbf{z}_3, z_2, r_1$
A	791	z_3, z_2, (0001), m_1
B	765	$\mathbf{r}_3, r_2, z_1$
B	770	$\mathbf{r}_2, r_3, z_1$
B	791	r_2, r_3, z_2, m_3, (0001)
B	793	r_2, r_3
C	760	$\mathbf{z}_2$, (0001), z_3
C	766	$\mathbf{z}_2$, (0001), z_3
C	767	$\mathbf{z}_3$, (0001), z_2, a_3
D	768	r_3, (0001), r_2
D	769	r_1, r_2, r_3, (0001)

or more sets are more or less equally developed (pls. 1C, 2B), and in others two non-parallel sets of faults are present in a broad fault-zone.

Associated with some of the faults are closely-spaced sets of fractures showing no displacements (pl. 2A). These resemble the so-called "feather-fractures" or "feather-joints" (Billings, 1954, p. 117) along some geological faults, and we shall refer to them by the former name. Feather-fractures are generally considered to be extension fractures originating with, or immediately after, the fault.

In addition to these two types of planar structures, there are other regular sets of fractures which show no displacements parallel to their surfaces; the best-developed set is generally parallel to the ends of the cylinders (pl. 1B). There is evidence that these are extension fractures produced on unloading the samples. Some long curved cracks are also present in the material (pl. 1B).

At small distances from the faults the quartz commonly shows little evidence of penetrative strain and may be indistinguishable from the undeformed material used in the experiments. Locally in some of the samples, however, there are extremely fine structures which can be recognized between crossed polarizers when the crystal is at extinction; these are described in more detail below. In the immediate vicinity of the faults, on the other hand, there is a narrow zone in which the optical orientation differs from that of the host crystal (pl. 2C). There is considerable fracturing on a very fine scale in these zones of reoriented material, and it is possible that the disorientation has resulted from rotation of submicroscopic blocks bounded by fractures. Along the faults themselves a thin zone of brownish, optically isotropic material may be present. In many instances this isotropic material contains tiny particles of fragmented quartz. Minute crystals of an optically anisotropic material of high refractive indices have also been observed in fault-zones in a few crystals.

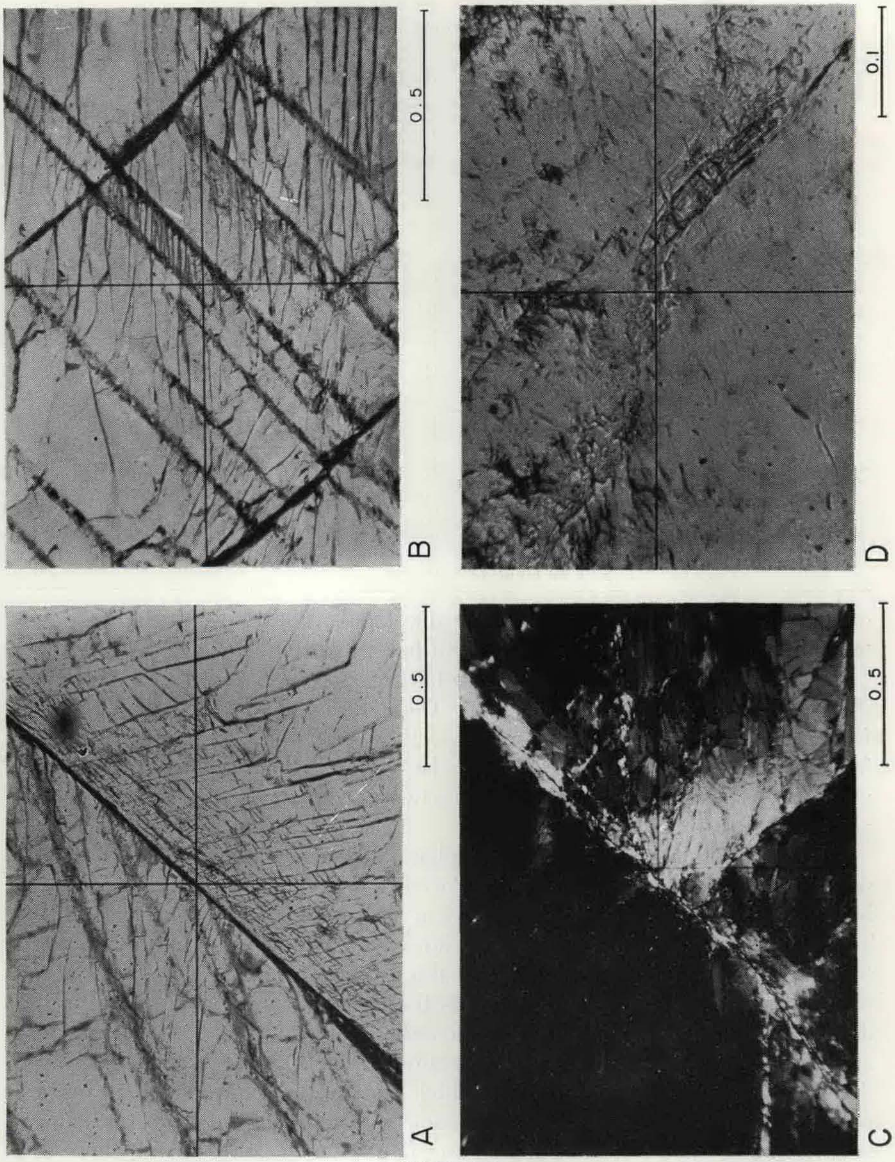

PLATE 2

Photomicrographs of structures and a new crystalline phase in thin sections of deformed crystals. Scales are in mm.

A. A fault with feather-fractures (lower right) and a subsidiary set of faults (upper left), inclined to the thin section, terminating against it. Direction of compression north-south. Plane-polarized light.

B. Intersecting sets of faults. Plane-polarized light.

C. Reoriented material along faults, between crossed polarizers. Note intense fracturing in reoriented quartz.

D. Segment of a thick fault-zone containing an elongate aggregate of slightly birefringent crystalline material with high indices (probably coesite). Plane-polarized light.