In the examination of the deformed crystals, a careful search was made for undulatory extinction and deformation lamellae of the type found in naturally deformed quartz. Both of these features were observed only in a small part of one sample (766); the lamellae were approximately basal and associated with slight undulatory extinction in zones parallel to the *c*-axis of the crystal.[2] In this experiment the piston broke, and there was consequently very rapid unloading of the sample. The stress conditions in the experiment were unknown, and it was impossible to determine whether the structures formed during loading or unloading. Similar structures were not produced in other samples of the same orientation. Though this is probably the first case in which these structures were definitely produced experimentally, it is relatively insignificant, since the conditions at formation were unknown. These structures have now been produced extensively in single crystals and aggregates (Carter, Christie, and Griggs, 1961; Christie, Carter, and Griggs, 1961) at similar confining pressures and higher temperatures. Heard (ms) has also produced these structures in quartzite at more moderate pressures and temperatures (5 kb and 300 to 500°C) in experiments at slow strain rates (10^{-6} to 10^{-8}/sec).

Orientation of the Planar Structures.—The orientations of the planar structures were measured in equally spaced traverses across the crystals parallel to the ends of the cylinders. It should be noted that a single planar structure extending diagonally across a section might be measured and recorded several times. The orientation of the *c*-axis was also determined in different parts of each section.

All planar features, including faults, feather-fractures, and other planar and curved fractures, were measured in several sections; in the majority of the crystals, however, the orientations of only the faults, feather fractures, and the optic axis were measured. Measurements were made on nearly planar portions of the curved fractures in those sections in which they were examined. Since it is impossible to reproduce the orientation data for all the specimens, only representative diagrams are reproduced. Data for the remaining samples are summarized in tabular form (table 2). Orientations are shown on an equal-area projection, using the lower hemisphere; the primitive circle in each projection represents the plane of the thin section in which the structures were measured.

The attitudes of the different types of structures in two specimens, 749 and 759 are shown in figures 6 and 7 respectively. A strong preferred orientation of all the structures is evident in the diagrams.

Specimen 749 (fig. 6) was cored and compressed perpendicular to the plane r_1. The most prominent set of faults is parallel to the base, and other well-developed faults are parallel to the negative unit rhombohedra z_2 and z_3. The feather-fractures, which are all associated with the basal faults, are approximately parallel to z_1, though there is a greater spread of orientation than for the faults; this parallelism of the fractures with z_1 may be fortuitous, since these structures are probably extension fractures, controlled by the orientation of the stress in the vicinity of the fault immediately after failure. The best-

[2] It is not possible to photograph these structures satisfactorily as they are visible only when the section is tilted steeply on the U-stage.

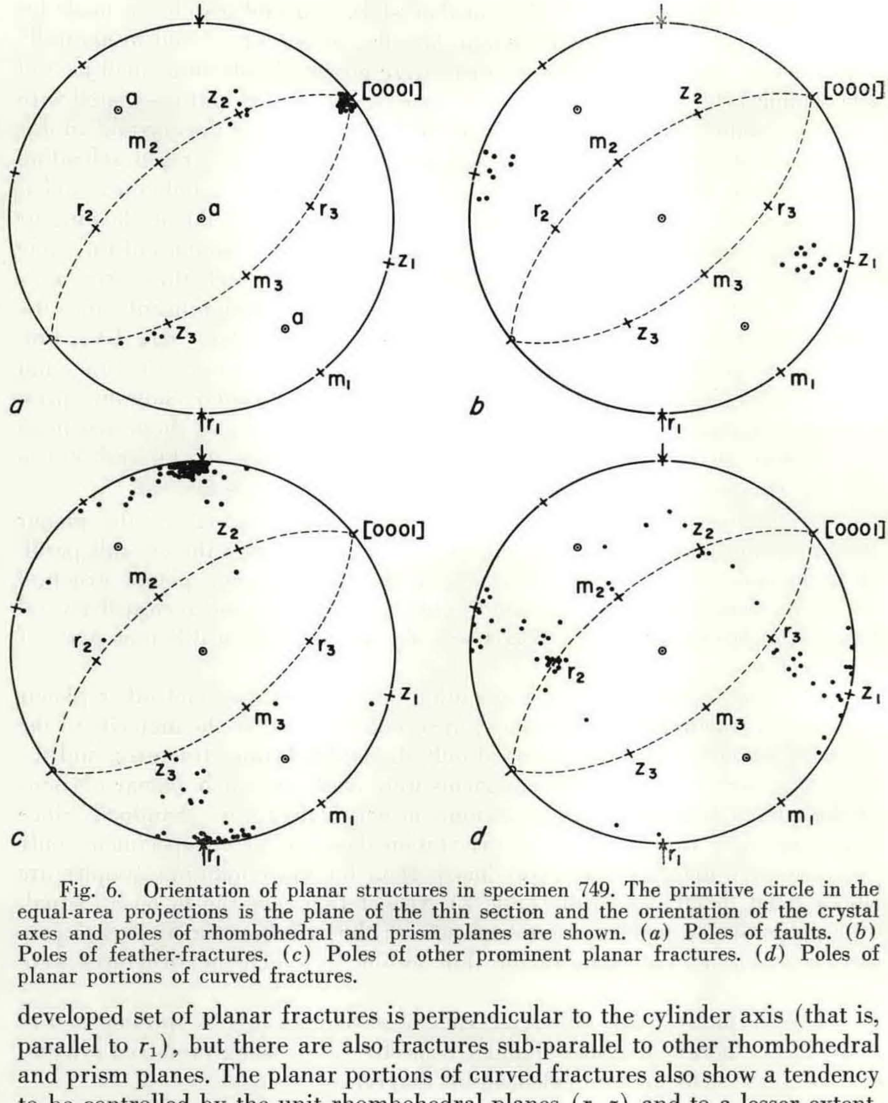

Fig. 6. Orientation of planar structures in specimen 749. The primitive circle in the equal-area projections is the plane of the thin section and the orientation of the crystal axes and poles of rhombohedral and prism planes are shown. (*a*) Poles of faults. (*b*) Poles of feather-fractures. (*c*) Poles of other prominent planar fractures. (*d*) Poles of planar portions of curved fractures.

developed set of planar fractures is perpendicular to the cylinder axis (that is, parallel to r_1), but there are also fractures sub-parallel to other rhombohedral and prism planes. The planar portions of curved fractures also show a tendency to be controlled by the unit rhombohedral planes (r, z) and to a lesser extent, the prism planes (m).

In specimen 759 (fig. 7), cored and compressed normal to z_1, the most prominent set of faults is also parallel to the base, and faults parallel to r_2 and r_3 and the prism m_1 are also present. Feather-fractures are associated with the basal faults and show a tendency to be parallel to r_1 (which may again be fortuitous); a few, possibly formed along the same faults on unloading, are almost parallel to z_1. The other fractures, not separated for this specimen, show a very weak preferred orientation; there are weak concentrations parallel to some of the rhombohedral planes.