with well-defined foliation from the Orocopia Schists. It consists essentially of quartz (95 percent) with minor amounts of calcite, plagioclase, garnet, chlorite, muscovite, biotite and opaque ore. The impurities are concentrated in thin layers which probably represent a relic bedding-structure. Under the microscope the quartz shows granoblastic texture with little or no dimensional orientation; the micaceous minerals are oriented with their cleavages subparallel to the axial plane of the fold. All the minerals, but especially quartz, calcite and chlorite, show evidence of post-crystalline strain.

In order to test the homogeneity of the preferred orientation of quartz in

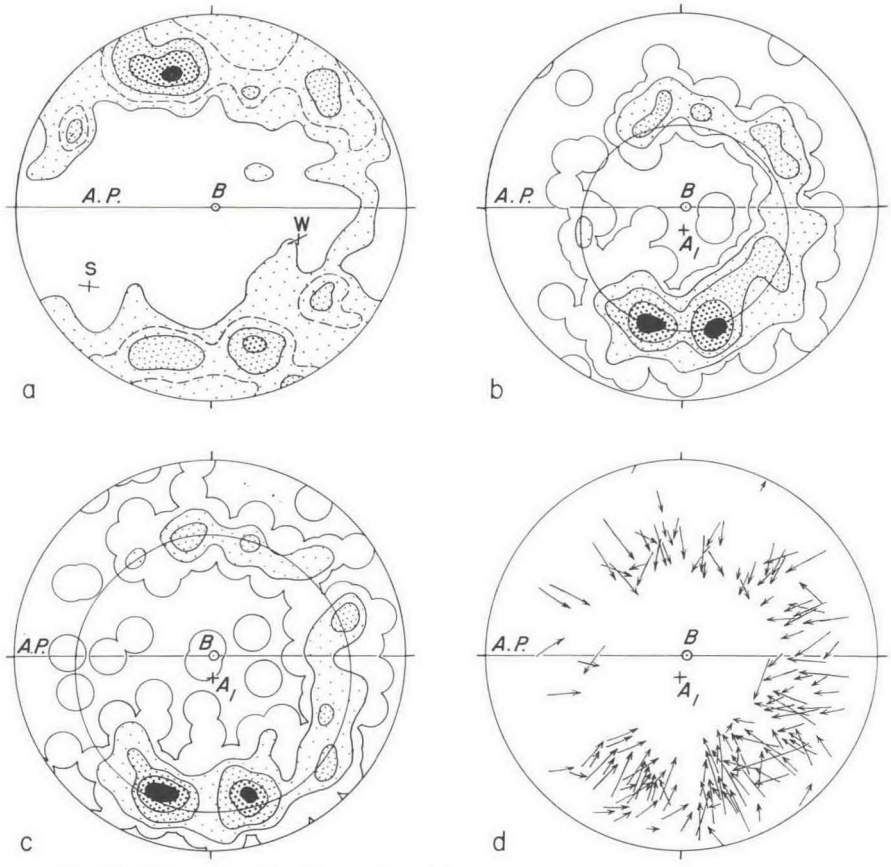

Fig. 2. Orientation data for specimen I.

a. Composite diagram: [0001]-axes of 817 quartz grains from the four sections. Contours: 4, 3, 2, 1½, 1% per 1% area.

b. Poles of deformation lamellae in 195 grains (195 sets of lamellae). Contours: 8, 5, 3, 1½, 1% per 1% area.

c. [0001]-axes of the same 195 grains containing deformation lamellae. Contours: 7, 5, 3, 1½, ½% per 1% area.

d. [0001]-axes (end of arrow) and poles of deformation lamellae (Point of arrow) in a representative number of grains from sections i-iv. A_1 is the axis of the small circle defined by the poles of lamellae and [0001]-axes of grains with lamellae. All four diagrams have the same orientation, shown by south (S) and west (W) directions in diagram a.

the specimen, analyses were carried out in four sections (fig. 1a). Three were cut parallel to the *ac* plane of the fold: one from each of the limbs (i, ii) and one from the hinge (iii). A further section was examined from a plan parallel to the fold axis (B) and approximately normal to the axial plane. The diagrams showing the orientation of [0001]-axes of quartz in the four sections are shown in figures 1b, 1c, 1d, 1e. The patterns of preferred orientation for all four sections are similar, indicating that the orientation of quartz is essentially homogeneous throughout the fold. The pattern of preferred orientation consists of a small-circle girdle, the axis of which is approximately normal to the axial plane of the fold (fig. 2a). The preferred orientation of micaceous minerals is also essentially homogeneous throughout the fold (diagrams not shown); the cleavage directions of the micas and chlorite are sub-parallel to the axial plane of the fold.

Deformation lamellae were measured in all the grains in which they were present and accessible for measurement with the U-stage. Each grain represented in the patterns of preferred orientation of quartz was carefully searched with the U-stage for lamellae, and it is therefore probable that in all the grains examined in each section all lamellae were measured except those inclined at low angles to the section and whose poles lie in the central "blind spot" in the diagrams. The partial diagrams showing the orientation of deformation lamellae in the individual sections show a strong similarity, indicating that there is homogeneity of this fabric element also throughout the specimen. The preferred orientation of the lamellae is such that the pattern obtained from the *ac* sections does not differ greatly from that obtained from the fold axis section; hence there must be few lamellae whose poles fall within the "blind-spots" in the diagrams.

The pattern of preferred orientation of the poles of lamellae (fig. 2b) is a small-circle girdle (about the axis A_1) containing two closely-spaced maxima and a number of sub-maxima. The poles of the lamellae therefore define (by their orientation) a cone with vertical axis A_1 and a semi-vertex angle of approximately 45°. The [0001]-axes of grains containing the deformation lamellae (fig. 2c) show a similar pattern of preferred orientation. They define a small-circle about the same axis A_1, but with a radius of approximately 60°; the small-circle contains maxima and sub-maxima which correspond closely with those in the pattern of lamellae poles (fig. 2b).

A striking feature of the grains with deformation lamellae is that the great-circle passing through [0001] and the pole of the lamellae generally passes through (or close to) the axis A_1 of the small-circle girdle. This is demonstrated in figure 2d, which shows the orientation of [0001] and the pole of lamellae in a representative number of the grains from all four sections.

Description of specimen II.—This specimen is a rather impure quartzite which is folded in a similar fashion to specimen I. The impurities comprise approximately 15 percent of the rock and include garnet, biotite, chlorite, muscovite and zircon. The garnets, zircons, and to some extent the micaceous minerals, are concentrated in layers defining the foliation, but the micas and chlorite are also disseminated throughout the purer layers of quartz. The micaceous minerals tend to lie parallel to the axial plane of the fold rather than the foliation. This tendency is most clearly observed in the hinge of the fold.