Description of specimen III.—This specimen is a quartzite containing as impurities less than 10 percent of garnet, chlorite, biotite and opaque ore. It has a well-developed planar foliation (S), defined by layers of the above minerals, and a very weak lineation (L = B). Many of the quartz grains are slightly flattened in the plane of the foliation and there is some elongation parallel to the lineation.

The analysis was carried out on two thin sections cut normal to the foliation, one parallel and the other perpendicular to the lineation (*bc* and *ac* respectively). Approximately 350 grains were examined in the *ac* section and 390 in the *bc* section. Partial diagrams of 200 grains each from the two sections are almost identical, indicating a very high degree of homogeneity in the field of this specimen.

The pattern of preferred orientation of [0001]-axes (fig. 4a) consists of a girdle more or less normal to the lineation; the girdle is cleft near the pole of the foliation and the main maxima are inclined to the foliation at angles greater than 45°. The poles of the deformation lamellae (fig. 4b) define two maxima of unequal strength and tend to spread into a small-circle girdle about the axis A_3. The angular radius of the small-circle is approximately 52°. The preferred orientation of [0001]-axes of grains with lamellae is again similar to that of the lamellae poles, the radius of the small-circle being approximately 64°.

Description of specimen IV.—This specimen is a pure quartzite with a crude planar foliation and no lineation. The rock is a deformed sedimentary quartzite in which the original clastic grains are recognizable. The grains are considerably flattened in the plane of the foliation and show intense undulose extinction and moderate marginal granulation; zones of crushed quartz in the specimen are inclined to the foliation, which is defined only by the dimensional orientation of the large quartz grains.

The analysis was carried out on three mutually perpendicular sections, one of which was parallel to the foliation, and approximately 200 grains were measured in each section. The [0001]-axes of the quartz grains show a weak preferred orientation (fig. 5a). The pattern consists essentially of a diffuse small-circle girdle about the pole of the foliation, but there is also a strong maximum lying close to the foliation. This maximum is present in the partial diagrams from each of the three sections and must therefore be significant. The partial diagrams are otherwise similar only in that they all show the small-circle pattern referred to above; maxima in this girdle are not reproducible in the samples of 200 points. This is considered to reflect the weakness of the preferred orientation rather than lack of homogeneity of the fabric.

There is a very strong preferred orientation of deformation lamellae in the rock (fig. 5b). The pattern of preferred orientation consists of two strong maxima spreading into a small-circle girdle about the axis A_4, the radius of the small-circle being approximately 38°. The [0001]-axes of grains containing deformation lamellae also define a small-circle girdle about the axis A_4 with a radius of approximately 50°. Great-circles containing the pole of the lamellae and [0001] in individual grains (fig. 5d) commonly pass through the axis A, as in the other three specimens.

Crystallographic orientation of lamellae.—The histograms in figure 6

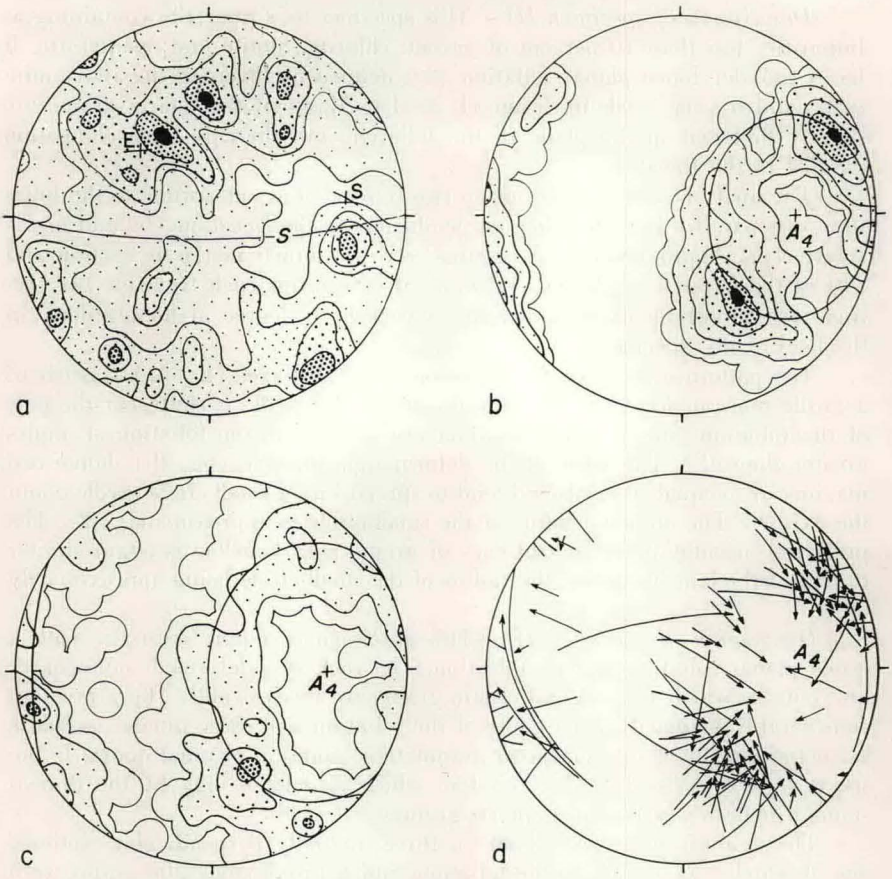

Fig. 5. Orientation data for specimen IV.

a. [0001]-axes of 607 quartz grains, measured in three sections. Contours: 2½, 2, 1½, 1, ½% per 1% area.

b. Poles of deformation lamellae in 204 grains (205 sets of lamellae). Contours: 10, 7½, 5, 2½, 1, ½% per 1% area.

c. [0001]-axes of the same 204 grains containing deformation lamellae. Contours: 4½, 3, 1½, ½% per 1% area.

d. Poles of deformation lamellae (point of arrow) and [0001]-axes (end of arrow) in a representative number of grains from each section. *S* is the foliation and A_4 is the axis of the small circle defined by the poles of lamellae and [0001]-axes in grains containing lamellae. All four diagrams have the same orientation, shown by east (E) and south (S) directions in diagram a.

show the angles between the pole of the deformation lamellae and the [0001]-axis ($C \wedge \perp L$) in the grains containing lamellae in each of the four specimens. The frequency distribution of these angles is similar in all the specimens: in the majority of the grains in each specimen the angle is between 0° and 40°, with a strong maximum in each case between 8° and 18°. The histograms are not dissimilar to those obtained by Fairbairn (1941) and Ingerson and Tuttle (1945) for the Ajibik quartzite, but there is a much greater variation in the ($C \wedge \perp L$) angle in the grains of the Ajibik rock. It is, of course, impossible to determine the orientation of the lamellae with respect to the hori-