resulted from slight deformation about a north-trending B-axis after the movement that produced the east-plunging B-axis.

Discussion of the Movements

The current controversy regarding the relative age of the Moine metamorphism and of movement on the Moine thrust has arisen because it has been generally assumed that there was only one phase of movement on the thrust, and that all the mylonitic rocks along the thrust were produced during this phase of movement. The evidence adduced in the foregoing sections proves that at least two and perhaps three separate phases of dislocation and movement are recognizable in the rocks of the thrust zone. These have been referred to as the primary and secondary phases of deformation; the east-trending folds (β_e, and B in the dolomite) are here referred to the primary deformation in view of the near parallelism of their axes with B in the primary mylonitic rocks. The contrast between the "brittle" style of deformation in the mylonitic rocks near the Moine thrust and the "plastic" style of the folding in the Moine schists does exist, but the cataclastic ("brittle") structures were mostly produced during the secondary phase of deformation, and this cataclastic breakdown affects the earlier-formed primary mylonitic rocks as well as the Moine schists (Christie, 1960). It has not generally been recognized that the primary mylonitic rocks, which include the true mylonites of Lapworth and the Survey geologists (Peach *et al.*, 1907), exhibit a style of deformation which is just as "plastic" as that in the Moine schists. The horizon mapped as the Moine thrust originated during the primary phase of deformation, when there was extensive penetrative movement throughout the zone of primary mylonitic rocks. Petrographic evidence indicates that this was contemporaneous with the regional metamorphism of the Moines. The thrust was only locally an active movement surface during the secondary phase of deformation, when the "brittle" structures were produced.

The primary deformation (I) may be divided into three phases, one following closely on the other. These phases of deformation were probably closely related. The secondary deformation (II) broke down the structures that were formed by the primary deformation, and the two main deformations (I and II) apparently are not related. The structures formed during each phase of deformation and the characteristics of each deformation are summarized in table 5.

During the early monoclinic phase of the primary deformation (I*a*) there was intensely penetrative movement throughout the zone of primary mylonitic rocks, and the Moine schists were transported toward the south-southwest along this "movement horizon." The presence of folds with southeast trend in the zone of dislocation, and the close relationship between these folds and the major thrusts, suggest that the Assynt nappes were transported during this phase of deformation. It has been inferred (p. 000) that there was movement of the lower Assynt nappe along the sole toward the southwest, and it is probable that there was also transport along the Assynt thrust in the same direction (pp. 000–000). These inferences are very significant, for they indicate that the Assynt nappes were derived from the northeast and not from the east-southeast, as claimed by Clough (in Peach *et al.*, 1907) and Bailey (1935). Thus, if Clough's correlation of the

Lewisian gneiss in the upper nappe at Loch Glencoul with that of the foreland in the Laxford-Stack area (fig. 25) is valid (and I believe it is), the nappe was transported a distance of 6 or 8 miles. Bailey has stated (1935, p. 159): "It is important also to bear in mind that the displacement of the Laxford-Stack line indicates a minimum movement of thrusting of six miles. It would require more courage to choose six miles approximately at right angles to the abundant flow structure of the district, rather than thirteen miles as closely as possible along the line of flow." The "line of flow" to which Bailey refers, however, does not

TABLE 5

Structures Formed during and Characteristics of Deformation Phases

Deformation phase	Moine schists and mylonitic rocks	Zone of dislocation
I*a*	1. Movement with monoclinic symmetry 2. B–folds produced 3. Deformation precrystalline and continuous	1. Movement with monoclinic symmetry 2. β_{se}-folds produced 3. Deformation postcrystalline and discontinuous
I*b*	1. Movement with orthorhombic symmetry (flattening) 2. Quartz and mica (in part) reoriented 3. Deformation paracrystalline and extremely penetrative	1. No evidence in most rocks 2. Possibly original (orthorhombic) fabric of dolomite produced
I*c*	1. Movement with monoclinic symmetry 2. Few east-plunging folds and kink zones produced in primary mylonitic rocks 3. Deformation less penetrative than in phases I*a* and I*b*	1. Movement with monoclinic symmetry 2. β_e- and B-axes produced in dolomite 3. Deformation postcrystalline and discontinuous
II	1. Movement with monoclinic symmetry 2. B_n- and B_s-folds produced 3. Deformation postcrystalline and discontinuous	1. Movement with monoclinic symmetry 2. β_n-folds produced 3. Deformation postcrystalline and discontinuous

have the significance that he attributes to it; the lineation is parellel to B and not to a, and the evidence of the fabric indicates that tectonic transport was indeed approximately at right angles to this direction.

Phemister (Read *et al.*, 1926, p. 21) has drawn attention to the possibility that the plutonic masses of Loch Borolan and Loch Ailsh have exerted some influence in the formation of the Assynt "bulge." The Loch Ailsh mass seems to be part of the upper nappe, and the Loch Borolan mass belongs to the lower nappe, and I consider that the latter has played an important part in the formation of the bulge, as Phemister has suggested. It is clear from figure 25 that by far the thickest and most extensive part of the upper nappe lies to the north of the Loch Borolan complex. The following hypothesis, though based largely on cir-