

The folds are generally overturned, with closely appressed limbs, and the style suggests considerable mobility. The majority of the folds are overturned toward the south-southwest. Thus there appears to be a common  $B$ -axis in the Cambrian rocks, the primary mylonitic rocks, and the Moine schists.

Along the margins of the zone of secondary deformation, fold structures plunge to the east-southeast and toward the north. The east-southeast-plunging folds are similar in style to those in the primary mylonitic rocks, and are obviously relict  $B$ -structures which have survived the secondary deformation. In the central parts of the zone, however, only  $B_n$ -folds are present (fig. 4, in pocket, inset, top right), and this inner zone will be called the  $B_n$ -zone. There is a small area of  $B_n$ -folds, isolated from the main  $B_n$ -zone, above the Moine thrust south of Loch an Eircill.

Certain types of mylonitic rock are characteristic of each of these structural zones. The primary mylonitic rocks (with  $B$ -structures) show the whole range of textures from true mylonites to quartz and chlorite schists. True mylonites are present near the thrust plane, but neomineralization is extensive and most of the rocks are augen schists and blastomylonites. Even some of the mylonitized Cambrian quartzite below the Moine thrust is completely recrystallized. The rocks in the zones of relict  $B$ -structures show the first stages of phyllonitization, and near the eastern margin of the zone there is considerable brecciation. At the localities marked by crosses (fig. 4, in pocket, inset, bottom left), kakirites are developed. The rocks in the  $B_n$ -zone are chiefly dark-colored phyllonites ( $p$ ), but in the northward extension of the zone ( $p'$ ) the rock is similar to the quartzofeldspathic Moine schists in appearance and composition. On weathered outcrops, however, the rock develops a carious surface due to the isolation of small lenticles. This lenticular texture is not found in normal Moine schists, but is characteristic of phyllonitic rocks.

There is an increase in the effects of phyllonitization from the margins of the zone of secondary deformation toward the center. Near the margins of the zone the lineation on the  $s$ -surfaces is obscured, and the surfaces assume a dull, uneven appearance which has been aptly described as "diseased" (Knopf, 1931, p. 6). In some pelitic layers a new  $s$ -surface, parallel to  $S'$  (fig. 5,  $b$ ), defined by the orientation of chlorite flakes, is produced; this is steeply inclined to the old  $s$ -surfaces ( $S$ ). Near the center of the zone the  $s$ -surfaces ( $S$ ) are intensely folded, but in the most extremely phyllonitized rocks the old foliation ( $S$ ) has been completely transposed. These rocks bear a superficial resemblance to phyllites, but close examination reveals that the  $s$ -surfaces are uneven or wavy, as in the "frilled schists" and the "oyster-shell rock" of the Survey geologists (Peach *et al.*, 1907, pp. 481, 598). Lineations are not common in the phyllonites, but in some there is a faint streaking on the  $s$ -surfaces, resembling slickensides. This lineation is approximately normal to the axes of  $B_n$ -folds; that is, it is an  $a$ -lineation. In some of the quartzite layers the old penetrative lineation ( $B$ ) is preserved and is locally folded about north-trending axes ( $B_n$ ).

Although many of the rocks that show phyllonitic textures are of pelitic composition, some are highly siliceous. The factor controlling the development of these textures seems to be the presence of a well-defined lamination in the rocks before deformation. Although the lamination is most marked in the chlorite-rich varieties of primary mylonitic rock, it is also present in the more siliceous members.

The unusual nature of the rocks in the Stack of Glencoul area was recognized by Clough, who named them "Stack-schists" (in Peach *et al.*, 1907, pp. 502, 505). He described them as "crumpled schists" and "puckered schist with thin siliceous streaks." With customary attention in detail, Clough recorded evidence of late-stage deformation: "The shear-planes are contorted and crossed by many almost horizontal fault-planes, which also cross the red mylonised stripes, and *must have been formed after the rock was in a mylonised condition*" (*ibid.*, p. 502; italics added).

The style of the  $B_n$ -folds is shown by the profiles in figure 8 and plate 3. The simplest type is illustrated by the fold in plate 3,  $a$ , on an outcrop near the eastern margin of the zone of secondary deformation. The  $s$ -surfaces ( $S$ ) are sharply folded, so that the steeper limbs define regular layers which dip between  $30^\circ$  and  $60^\circ$  to the east. The more complex folds (pl. 3,  $b$ ) are angular, with axial planes dipping toward the east. The folds show all the properties of flexural slip folds (Knopf and Ingerson, 1938, pp. 160-162); in competent siliceous and pegmatitic layers the folds have rounded profiles, whereas in adjacent incompetent layers the folds are smaller and more angular. In general, the complexity of the folding varies with the composition of the rocks, the quartzites showing the simplest style and the pelitic rocks, the most complex. The folds commonly show attenuation along the limbs and thickening at the crests.

Folds of the type shown in plate 3,  $a$ , have been described by German writers and are variously termed "*Knitterung*," "*Knickbänder*," "*Zerknitterung*," "*Ver-schiebungsflächen*," and "*Knickzonen*" (Hoeppener, 1955, pp. 34-35). The structures are analogous to the so-called "kink-bands" in deformed crystals (Turner *et al.*, 1954, p. 896). They are referred to below as *kink zones*.

Figure 9,  $b$ , is a diagrammatic section across the Stack of Glencoul area showing the relationship between the Moine and Ben More thrusts and the structural zones (fig. 4, in pocket,  $RB$  and  $B_n$ ). Peach and Horne (Peach *et al.*, 1907, pp. 471-472; Peach and Horne, 1914, p. 19) considered that the Ben More thrust was overlapped by the Moine thrust in this area, indicating that the movement on the Moine thrust outlasted that on the Ben More thrust. It is clear, however, that the Moine thrust has suffered a reverse displacement of 500 to 1,000 feet above the Ben More thrust and the associated system of faults; and it is also in this zone that the primary mylonitic rocks and the Moine schists have suffered the most intense secondary deformation. Thus the evidence clearly indicates that the displacement of the Moine thrust and the secondary deformation were produced by movement on the Ben More thrust. Movement on the Ben More thrust, then, must have taken place, at least in part, after movement on the Moine thrust had ceased. In the kink zones within the zone of relict  $B$ -structures (fig. 9,  $a$ ), the movement picture is exactly the same as that in the rocks below the Moine thrust: the  $s$ -surfaces ( $S_1$ ) are "kinked" along layers ( $S_2$ ), which I believe are genetically related to the Ben More thrust and associated reverse faults. Combined with the slip movement parallel to  $S_2$ , there is slip on the foliation  $S_1$ . The parallelism of the axial planes of more complex folds with  $S_2$  suggests that they have originated in a similar fashion. The folds probably originated as kink zones and evolved into the more complex forms by continued slip on  $S_1$ . The presence of the competent layers