

THE CNOC A' CHAORUINN AREA

General description of the area.—Figure 10 (in pocket) is a structural map of the area between Loch Ailsh and the Allt Ealag, in the southeast corner of the Assynt "bulge." The ground is comparatively well exposed in the vicinity of the Moine thrust, where the mylonitic rocks form the customary scarp feature, but to the west of the thrust zone and over the Moine schists to the east there is a thick covering of peat and the rocks are poorly exposed.

The map (fig. 10) differs in a number of important respects from those published by the Geological Survey. The Ben More thrust is shown on the Survey maps crossing the peat-covered area south of Strathsheaskich and following the course of the Benmore Lodge road north of Cnoc a' Chaoruinn. The thrust is supposed to extend westward from the area covered by figure 10, and to carry the klippen of Lewisian, Torridonian, and Cambrian rocks which rest on the limestones and marble south of Loch Urigill and Knockan village. My field observations indicate, however, that the thrust follows another course in this area. Calcareous rocks with basic intrusions outcrop in a number of knolls projecting from the peat south-southwest of Strathsheaskich. In the most prominent of these knolls, an important dislocation separates the coarsely crystalline dedolomitized marble (λ) along the margin of the Loch Borolan syenite mass from unmetamorphosed limestone and dolomite with fragments of basic sills to the east. This dislocation may be traced southward toward the Lairg-Lochinver road, where it is associated with a complex zone of imbrication (fig. 10, in pocket, inset map). The line of outcrop of this dislocation intersects that of the Moine thrust south of the road. I interpret this dislocation as the southward extension of the Ben More thrust from Sgonnan Beag, north of Strathsheaskich.

Another thrust, east of the Ben More thrust, carries the Cambrian quartzite that overlies the limestones at Strathsheaskich and the quartzite, Fucoid Beds, Serpulite Grit, and limestones on the north and west slopes of Cnoc a' Chaoruinn. It is the westerly continuation of this thrust which carries the klippen south of Loch Urigill and Knockan (fig. 25). Sabine (1953, pp. 151–152) has proposed the term "Assynt thrust-plane" for this thrust, which he believes to be, in effect, an extension of the Glencoul thrust. I am in agreement with this interpretation, and retain the term "Assynt thrust" for this dislocation. The relationship of the thrusts is discussed in more detail below.

The rocks above the Assynt thrust are Cambrian quartzites, Fucoid Beds, Serpulite Grit, and limestones, with numerous sills of felsite- and hornblende-porphyrite. The rocks show a considerable degree of cataclastic deformation, and the intrusive rocks are generally foliated. The stratigraphic sequence from quartzite to limestone is recognizable only in the small area immediately to the west of the Ben More thrust. East of the Ben More thrust the succession consists of a repetition of serpulite grit, acid and basic sills, and limestones; there are at least two serpulite grit horizons in the succession, indicating that it has been repeated by folding or thrusting. In the Oyckell Valley this repeated succession is gently folded about an axis trending slightly north of east, whereas on the north slope of Cnoc a' Chaoruinn the beds dip consistently toward the south. Here the succession, already

repeated by folding or thrusting, is further disturbed by a number of reverse faults of slight throw. These faults dip steeply toward the east. The reverse faults become more closely spaced toward the Ben More thrust, and it is evident that they belong to a zone of imbrication associated with the Ben More thrust.

On both sides of the Oyckell Valley a slice of foliated and lineated quartzite, similar to those in the Stack of Glencoul area, outcrops below the Moine thrust.

The primary mylonitic rocks occupy a zone between 100 and 150 feet thick above the Moine thrust. They show a high degree of neomineralization and grade upward into low-grade "granulitic" Moine schists. A lenticle of quartzite, represented on the Survey maps as quartz schist, outcrops in the zone of primary mylonitic rocks in the Allt nan Sleagh. The quartzite is similar to the Cambrian quartzites below the Moine thrust and contains similar structures. As there are no pure quartzites in the Lewisian, Torridonian, or Moine, the lenticle probably represents a fragment of Cambrian quartzite which has been isolated at some stage in the thrust movements and included in the color-layered mylonitic rocks.

There is widespread secondary deformation of the primary mylonitic rocks and the Moine schists. The degree of deformation is slight in the schists along the southern and eastern margins of the area covered by the map; locally there has been slight movement of joints but there is no brecciation. The effects of secondary deformation increase toward the Moine thrust. The incompetent layers near the thrust have been converted to phyllonite and at some localities (e.g., in the Allt na Cailliche) there has been movements of joints and slight brecciation in more competent primary mylonitic rocks. Secondary deformation is most intense in two zones (fig. 10, in pocket), one on the west slope of Cnoc a' Chaoruinn and the other in the river Oyckell. In these zones the primary mylonitic rocks are phyllonitized and the Moine schists are severely brecciated. The larger of the two zones outcrops above the fault system associated with the Ben More thrust, as in the northern area at the Stack of Glencoul. The smaller zone, in the river Oyckell, cuts across the Moine thrust and the boundary between the primary mylonitic rocks and the Moine schists. At the southern end of the smaller zone the schists are penetrated by discordant veins and stringers of granitic material, which are also sheared and brecciated.

Structural data.—The foliation in the primary mylonitic rocks and the Moine schists throughout the area dips consistently toward the southeast (fig. 11, *a*). In the secondary mylonitic rocks (fig. 11, *b*) the strike of the foliation is generally north-northwest, and the dip, though variable, is generally toward the east-northeast at approximately 45° . The fold axis (β , fig. 11, *b*) plunges at 15° to the south-southeast. Small-scale folds are common in the quartzites below the Moine thrust and in the primary and secondary mylonitic rocks. The Moine schists, on the other hand, are unfolded except at a few widely scattered localities. Figure 11, *c*, shows the orientation of small-scale folds measured throughout the area. The majority of the folds plunge to the east-southeast (*B*), but there is a submaximum in the diagram, representing folds that plunge toward the south-southeast (*B_s*). A persistent lineation, plunging to the east-southeast, is common to the quartzites below the Moine thrust, the primary mylonitic rocks, and the Moine schists (fig. 11, *d*). The partial diagrams in figure 12 show the orientation of folds and lineations in