

andesite, a basic rhyolite not very similar to that of Midlothian township, some beds of slaty tuff, and some masses of cherty tuff very like the similar rocks of Midlothian township. The cherty tuffs lie at the north and south ends respectively of the anticline and hence are the uppermost beds exposed, corresponding in position to similar beds in Montrose and Midlothian; but the other rocks seem to have no definite order of extrusion such as exists in northern Quebec. Thus, on the north side of the Cobalt series opposite Bell island the order of succession is: (1) basic rhyolite; (2) black aphanitic rock, possibly a basalt; (3) andesite containing a little free quartz, but more basic than (1); (4) slaty tuff, interbedded between the flows of andesite (3); (5) basalt; (6) cherty tuff. It must be remembered also that the rhyolite (1) is not the bottom of the series. The succession is, therefore, very much more complicated than that in northern Quebec or there has been faulting of so complex a nature as to destroy entirely the original succession. The latter suggestion is not improbable, as there is known to have been much faulting around Mistinikon lake.

The peridotites, as has been shown (page 11) are intrusive into the rhyolites, and, therefore, are the youngest rocks of the basement complex.

Folding. The rocks of the basement complex have all been closely folded and now generally lie in almost vertical positions. Data as to their structure are rather scanty, but enough have been obtained to determine the principal large structures.

In Midlothian and Montrose townships the volcanics and the Kiask series have been folded together. Strike and dip observations taken on a large number of rhyolite flows and interbanded beds of tuff and cherty tuff invariably showed the dip and strike of the rhyolite parallel to that of the overlying Kiask sediments, so that there does not appear to be any structural unconformity between them. As the structure of the Kiask series here is synclinal, the structure of the underlying rhyolite was concluded also to be synclinal. This conclusion was strengthened by a number of grain determinations made, according to methods outlined by the writer in a recent paper,¹ on the flows to the south of the Kiask boundary in Midlothian township, which indicated that the north side of the flows is the upper. In addition, some beds of fine-grained rhyolite tuff (page 13) occur between the Kiask conglomerate and the rhyolite to the southwest of Midlothian lake, and follow the contact for several miles. They must have been laid down on top of the rhyolite, thus again indicating that its north side is the upper.

The axis of this fold, which will be more fully described during the discussion of the folding of the Kiask series, strikes north 65 degrees to 70 degrees east, and at its west end plunges to the east at a high angle. The axis of the Bannockburn anticlinal cross fold (see "folding of the Kiask series") strikes north 10 degrees west. Other data obtained at various places in the area show that these directions are pretty closely the strikes of the axes of the major and cross folds over the whole area. The strikes of the flows or tuff beds at any given point will, of course, depend on the position of the bed in the fold and the plunge of the axis of the fold.

If the axis of the Midlothian syncline be projected eastward, it crosses Mistinikon lake about the point where the down-faulted blocks of Kiask

¹ Jour. of Geol., 1919.