

places between Midlothian creek and Niven's line. The slates are very similar in composition. To the eye they are black or greenish, fine-grained rocks filled with rhombs of carbonate. Under the microscope they are seen to consist of a fine-grained matrix of chlorite, sometimes with fine-grained feldspar and quartz, sometimes with kaolin and sericite. Some magnetite is always present. Carbonate crystals have replaced parts of this groundmass, developing apparently at the expense of chlorite, sericite, and kaolin there. The quartz and albite do not seem to have been replaced, and may be seen within the calcite crystals in sections, in the same number and general arrangement as they possess outside the calcite. Part of this carbonate is siderite, part calcite or dolomite. Altogether it forms about 25 per cent of the rock. In some cases well-formed calcite crystals are rimmed with magnetite grains, in others with muscovite fibres whose long axes are arranged parallel to the crystal boundary against which they lie. They would seem almost to have been pushed aside by the crystal during growth.

Calcareous Rocks.

Above the slate layers, principally in the southern part of Montrose township, a number of light-coloured soft rocks were found interbedded with the more characteristic grits and arkoses. Examined under the microscope these were found to have been essentially like the arkoses and grits; but the material that composes them either had a better chance to decompose than that of the ordinary arkose before being laid down in its present position, or the original texture was looser for some reason, and permitted more rapid secondary alteration to go on. At any rate these rocks have been coarsely fragmental grits, but are now badly altered to mixtures of chlorite, kaolin, sericite, and calcite.

Around Sinclair lake there is a fine-grained, moderately hard greywacke, a most monotonous light grey mud rock with little or no appearance of bedding. It covers a large part of the Bannockburn area on account of the flat-bedded structure of the area. It is seen under the microscope to be a typical greywacke of this series. Sharp angular fragments of minerals up to 0.2 mm. in length constitute about 40 per cent of it. Roughly three-quarters of these fragments are quartz, the remainder mostly oligoclase. They are embedded in a very fine-grained matrix of kaolin with a little epidote and sericite.

DISTINCTION BETWEEN KIASK AND COBALT SERIES.

Distinction between the Kiask series and the Cobalt series is difficult in places, especially in the Bannockburn area, where the Kiask series lies flat. The only distinction possible, where similarity in structure occurs, is based on the petrographic differences between the rocks of the two series. The Cobalt series in this vicinity is very largely composed of debris of reddish granite and syenites. The conglomerates are filled with red granite pebbles, the arkoses are red with abundance of red feldspar grains, the quartzites and black slates contain interbanded reddish beds, and, even where outcrops of black slate are not large enough to expose the reddish beds, grains of red feldspar can be observed on almost any freshly