pieces of feldspar. Other varieties contain numerous fragments of rhyolite up to one-half inch diameter. All gradations between the two types are found. The matrix, where fresh, is largely oligoclase feldspar, slightly replaced by calcite and sericite. Quartz, titanite, pyrite, and chlorite are accessory. The composition of these cherty rocks shows clearly that they are mixtures of fine ash, cemented by chemical sediment from solutions given off by the rhyolites, and probably partly altered by these solutions. The bedded structure separates them from the rhyolites, which they often strongly resemble otherwise.

Rhyolite Tuffs.

In addition to the breccias and cherty tuffs, a series of well-bedded tuffs are found between the rhyolite and the Kiask series, to the south and southwest of Midlothian lake. They locally attain thicknesses of 200 to 300 feet. They vary in composition from cherty tuffs to slates and arkoses of one-quarter mm. grain, and are entirely composed of rhyolite fragments and dust, usually badly altered. The alteration is of the same type as that which the rhyolite has itself undergone, i.e., carbonation and sericitization, and is presumably due to the same cause. The tuffs, therefore, must have been laid down rapidly and soon after the rhyolite. The well bedded nature of the tuffs indicates that the rhyolite was extruded into water.

Varying amounts of siderite and other carbonates in well developed crystals are present in the tuffs. Carbonates may form as much as 70 per cent of the rock, but commonly not over 25 per cent. They have been developed in situ, by the replacement of the feldspar and sericite of the tuff. Under the microscope, the carbonate is seen to be full of inclusions of quartz, which were not affected by the solutions which altered the other constituents, and which, therefore, remain unaltered and retain in the calcite crystals the pattern that they had in the original rock.

Andesites and Basalts.

The andesites and basalts are prevailingly rocks of fine to medium grain, and a dark green colour. The andesites are somewhat lighter in colour than the basalts, and frequently contain white phenocrysts of feldspar up to 1 mm. diameter. The name "greenstones," commonly applied to these rocks, is expressive of their general appearance.

The rocks formerly consisted of hornblende or pyroxene and plagioclase, with accessory ilmenite. Metasomatic alteration has largely destroyed the original constituents, replacing the plagioclase with albite and oligoclase albite, the ferromagnesian minerals with chlorite, and the ilmenite with leucoxene; developing at the same time more or less sericite and calcite. The alteration, however, has not destroyed the original structures and textures. Pillow texture is one of the commonest of these, and is found in many places. It is well developed on Hutt lake and may be seen on lake Kitchimine. It was found in Yarrow township on the shore of Mistinikon lake, in Powell township near the gold deposits, and in Cairo township near the end of the portage past the long rapid of Montreal river. Spherulitic textures occur in the northwest part of Bannockburn