

Hence, in the quantitative classification, the rock is of the class persalane, order columbare, rang albachase, and subrang albachose.

Internal Relations.—The folding and faulting, to which the sills have been subject, is evidenced by the attitude and the distribution of the sills now exposed in the Purcell range. As they were intruded when the strata were flat, they have suffered all the movements which have taken place in that range, so that now they form anticlines and synclines with all angles of dip from 0 to 90 degrees. The sills often end abruptly against strata which are older or younger than those holding the sills, and in some cases the vertical displacement may be several thousands of feet. Columnar jointing, perpendicular to the upper and lower contact, is especially prominent in the thick sills and is well shown in the escarpment to the north of St. Mary lake. The cross-section of the columns is an acute angled quadrilateral.

The most striking phenomenon in the internal structure of the sills is a stratification of the material according to density. The stratification is of two kinds. In the example, studied with Daly on the International Boundary line, the distribution of material was: an upper gabbro zone 26 feet thick passing gradually downwards into a granitic phase 80 feet thick, which in turn gradually passed into a lower gabbro layer 30 feet thick. This type of differentiation is similar to that at Shonkinsag described by Pirsson.¹

The other type was studied in the St. Mary sills and consists of an upper granitic layer 70 feet thick passing gradually downwards into a gabbro zone also 70 feet thick. All gradations exist between the granite (micropegmatite) and the gabbro, and an arbitrarily chosen type, representing the intermediate rock between the two extremes, is called the quartz-diorite. The thick basic sills also show a rough stratification in the centre of their masses, where long schlieren of acid material are elongated parallel to the contacts of the sills. The gabbro at the contacts of these basic sills is usually fine-grained, while in the centre it is coarse-grained and pegmatitic. A discussion of the

¹ Pirsson, U. S. G. S. Bull. 237, p. 43.