

origin is supported by the association of the rhyolites and basalts in the Purcell Lavas, the supposed extrusive phase of the Purcell Sills.

PETROGRAPHY OF THE SILLS.

As mentioned above, the sills fall into two groups—a simple type composed almost solely of gabbro, and a composite type consisting of granite (micropegmatite), quartz diorite, and gabbro, always arranged in a stratiform fashion. These composite sills are of two types; in some cases the granite (micropegmatite), occupies the upper portion of the sill, grading downwards into gabbro (Sudbury type); while in the other type the granite (micropegmatite) is near the upper contact and grades towards each contact into gabbro (Shonkinsag type). Thus, there are three main rock types in the composite sills, and one rock type in the simple sills. Of these, gabbro is common to all types of sills.

Lithological Characters.—The rocks which constitute the Purcell Sills vary in composition from a hypersthene gabbro to a very acid granite (micropegmatite), with members intermediate between these two extreme types. The texture of the sill rock varies from fine-grained to porphyritic. The granite (micropegmatite) is always associated with gabbro and occurs at or near the upper contact of the sills. The thickness of the granite (micropegmatite), which grades downwards into a hornblende gabbro, bears no relationship to the thickness of the sill. In some cases, where the granite (micropegmatite) is not at the immediate upper contact, it grades upwards into a quartz diorite and finally into a gabbro.

Before proceeding to the general discussion as to the origin and distribution of the granite (micropegmatite) in the sills, a description of the three main rock types will be given. It must be remembered that all three types pass into each other by gradual transition.

Gabbro.—The most basic type is hypersthene gabbro and occurs in one of the St. Mary sills. It is a dark grey, crystalline rock of granitic texture, in which can be detected plagioclase and augite. The rock is quite fresh, the feldspars being clear and