

(b) The composite sills represent a simple magma later injected with the acid material coming either:—

- (1) directly from an intercrustal reservoir;
- (2) or from lower sills in which any of the things listed under 2a may have happened.

It is believed that the simple and composite sills are magmatically related, for, if they belonged to distinct intrusions, one would expect to find some evidence of this in the field. But such has not been found, though the simple and composite sills occur in the same sections and have been examined in many places over a very wide area. Also the gabbro in both types is identical in composition and all gradations occur between the gabbro and the granite (micropegmatite). The rock types are analogous to the extrusive phases—the Purcell Lava—and as both acid and basic lavas occur closely associated, it is evident that they are genetically related. Hence, it is concluded with some degree of certainty that the two varieties of sills are magmatically related.

That such an intrusion of related acid and basic magmas is possible, is supported by the relations existing between the Buttermere and Ennerdale Granophyr of England.¹ In the Buttermere and Ennerdale districts occur intrusions of dolerite and granophyr into slates and volcanics. A point of resemblance between the phenomena exhibited in the two districts arises in connexion with the dolerite which precedes the granophyr in time of intrusion and which contains towards the centre of the mass, numerous pink patches of acid material which strongly resemble the main mass of the intrusive granophyr. Rastall supposes that the pink patches in the dolerite are a *Mixture Rock* and the following extract is quoted from his paper.²

“According to this, the basic dolerite was first intruded, and while still hot and partly liquid in the middle, another intrusion of more acid character took place from the same reservoir and penetrated into the still unconsolidated centre of the earlier intrusion producing a hybrid rock intermediate between the granophyr and dolerite.”

As already stated, Rastall has strong evidence that the two main intrusions of dolerite and granophyr are magmatically related.

¹R. H. Rastall, Q. J. G. S., vol. 62, 1906, p. 253.

²Ibid p. 263.