

time of its solidification. It may also be fairly assumed that those portions of the magma adjacent to the fissure walls cooled more rapidly and solidified earlier than did the middle portion. Thus although we have in current petrographical literature numerous references to great pressure as one of the chief causes of the development of the coarser texture and granitic structure of the plutonic rocks as compared with that manifested by rocks which solidify at or near the surface, the present case seems to establish the fact that both types of rock structure may be developed under one and the same pressure. Difference in pressure under which magmas solidify is, therefore, probably, not so important a cause of the difference in structure and texture of rocks as is generally supposed. On the other hand we have in the case under consideration strong presumptive evidence that the rate of cooling which must have been rapid at the sides and slow in the middle, exercised the controlling influence over the character of the rock developed from the magma in any given part. With regard to the conditions which determined the chemical and mineralogical differentiation of the dyke rock very little can be definitely affirmed. It seems probable, however, that the explanation lies in the earlier separation of the more basic minerals accompanied by a transference of more acid residues (or solvents) to the middle portions, which transference was facilitated by the gradual solidification of the magma from the dyke walls toward the middle, and by the movement of the water constituent of the magma towards the middle. The water of the magma, so long as the latter remained liquid, would have a tendency to escape to the surface. This tendency, taken with the tendency of the higher portions of the dyke to solidify more rapidly than the deeper-seated portions would create a current obliquely through the magma, upward and inward from both sides. This current would aid in the transference from the sides to the middle of the more acid portions of the magma from which the more basic had separated out.

Numerous other dykes have been examined with the same general result as that arrived at by a study of Stop Island dyke. In none of these, however, was the differentiation in character found to be quite so strongly accentuated as in the Stop Island dyke. A series of specimens taken across the dyke which cuts the south-east shore of White-fish bay, and which is referred to in former