

the ordinary rocks the pyroxenes much predominate, but these shade into rocks in which the reverse is true, the hornblende increasing up to complete exclusion of the pyroxenes. With this increase in hornblende biotite always appears in the rock, this mineral being usually lacking in the pyroxenic varieties. Further, the more quartzose varieties are more apt to be those with predominating hornblende, though this is by no means a general rule.

*Extreme variations.* Besides these minor changes in character, more extreme variations of these rocks occur, on the one hand into granitic, on the other into gabbroic rocks, variations which can however be traced into the ordinary rock step by step.

The most striking instance of a change of this sort which has received careful description is found in Smyth's account of the Diana syenite belt.<sup>1</sup> At the time when this paper was written the syenites had not been differentiated from the anorthosites and gabbros, and the rock was described as a variety of gabbro, and its variations as variations of a gabbro mass. Smyth's description, however, shows that he clearly apprehended the differences between the rock and ordinary gabbro, and he distinctly states its syenitic character, and moreover in a later publication wholly withdraws the rock from the gabbro class.<sup>2</sup> Unfortunately this has not been apprehended by the several writers who have had occasion to refer to this important paper, and the special variation into a red gneiss which will be shortly described is referred to as a variation of gabbro into red gneiss. The truth is that no such variation of gabbro is known in the region, while variations of the syenite into red, granitic gneisses are the rule rather than the exception.

The special interest attaching to this Diana syenite arises from the clearly exhibited differentiation of the gray, feldspathic syenite into a dark colored rock of gabbroic appearance. The minerals are the same in both and are practically the same as in the Loon lake rock, but the pyroxene and hornblende are in much larger quantity in the dark rock, constituting from one third to one half of the whole, while they appear in but scant amount in the ordinary syenite at Diana. At the same time plagioclase increases in amount at the expense of the micropertthite, and

<sup>1</sup> Geol. Soc. Am. Bul. 6: 271-83.

<sup>2</sup> N. Y. State Geol. 17th An. Rep't. p. 472.