L. W. BAILEY ON GEOLOGICAL CONTACTS AND ANCIENT

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brian, Mica-schist group and Quebec group. Until within the last year or two, however, no definite knowledge existed, either as to the true limits or relations of these several sets of rocks, or even whether in the lower group there might not really be included several distinct formations. In 1879, the base of the Upper Silurian in that part of Carleton County lying east of the St. John River was approximately fixed by Mr. Matthew, and, simultaneously but independently, a like boundary was determined by myself between the town of Woodstock and the Maine frontier. More recently both of these districts have been reexamined and the line of contact of these formations carefully studied for a distance of not less than thirty miles. Though somewhat obscured by overlying carboniferous sediments, the unconformity of the two is, nevertheless, strongly marked : first, in the occurrence at the base of the upper series of thick beds of calcareous conglomerate filled with fragments (black silicious slate and petrosilex) derived from the group below; secondly, in a difference both of strike and dip; and thirdly, as a result of this difference, in the progressive overlapping of the newer formation upon the several members of the older. The fossils of the later group are numerous and varied, and indicate an horizon corresponding either to that of the Niagara or Lower Helderberg; in the lower are a few shells and graptolites, together with fragments of trilobites, apparently of the genera Trinucleus and Harpes, but too poorly preserved to be certainly determinable.

The relations of these supposed Cambro-Silurian rocks to the granite open up numerous questions, as interesting as they are difficult. They present, indeed, only another phase of the well-known Taconic controversy, so admirably summarized and discussed by our distinguished Vice-President in the lately issued volume of our Transactions. Into the broader questions involved in this controversy it is not necessary, nor do I feel prepared, to enter; the objects of the present paper will be sufficiently served by presenting a few facts of actual observation in the field, with such conclusions as are of direct local application. In the case of both of the great granite belts which traverse New Brunswick, the contacts of the latter with the bordering stratified rocks are best seen along their northern edge, from which overlying material has been for the most part removed, while it has been extensively accumulated along that of the south. Where thus exposed it invariably presents the following features :—

1. The transition from massive, compact and uniform granite to the associated schists or other rocks is instantaneous and abrupt.

2. The invaded beds vary greatly in character, embracing coarse and fine gneisses, mica schists, chloritic and hornblendic schists and fine micaceous sandstones.

3. Foliation and crystallization are most marked in the vicinity of the granite, and decrease in receding from the latter, but vary greatly in the apparent distance to which the effect has extended, this being in some instances only a few yards, while in others it is several miles.

4. The outline of the granite is irregular, and, while in part parallel to the strike of the enclosing schists, at others it intersects these obliquely or even at right angles, or sends into the latter irregular tongues.

5. Detached masses or bosses, of various forms and sizes, border the main granitic areas, indicating, beneath the schists, a wide-spread and uneven granitic floor.

6. Granitic veins, not different from the main mass of the granite, but readily distin-