

VI.—NOTES ON THE SUPERFICIAL GEOLOGY OF KINGS CO., N. S.  
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Kings County has an average length and breadth of 35 by 25 miles, but within this somewhat limited area there is very much to interest the student of geological phenomena.

Facing the Bay of Fundy on the northern side, and protecting the rest of the county from the chilling fogs, somewhat too prevalent in that arm of the Atlantic, stretches the noted trap ridge, known as North Mountain. This extends eastward from the Annapolis boundary to the famous Cape Blomidon, where it takes a northerly direction, then doubling on itself stretches westward till it terminates in the rugged but picturesque cliffs of Cape Split. The length of this ridge in the county is fully 45 miles, and it can be traced under the waters of Minas Channel for a long distance, making the rips off Cape Split and also those off Cape d'Or on the Cumberland side of the Channel. On the south of this mountain lies a valley with an average width of about  $6\frac{1}{2}$  miles. The surface rock here is Triassic sandstone underlying the trap at their junction, as is well seen at Cape Blomidon. This valley is drained by four rivers, the Pereaux, Habitant, Canard and Cornwallis, flowing eastward into Minas Basin, and having at their mouths large alluvial deposits composed of the comminuted sandstone and trap deposited daily by the tides. On the Canard river alone 2500 acres of this have been reclaimed, making most valuable hay-land. On the south of this valley, and generally parallel to the North Mountain runs the South Mountain range. At Gaspereau Lake this subdivides making the narrow valley of the Gaspereau River. The spur or offshoot of the South Mountain has its greatest altitude in Canaan, whence with a gradual descent it runs in the rear of Wolfville, and terminates at Horton Landing.

The southern part of the county is elevated, and is mainly covered with forests interspersed with lakes. Vast masses of granite form the outcrop.

#### GEOLOGICAL HORIZONS.

The northern part of the county, including the trap ridge and the valley sandstone, is without doubt Triassic, as it conforms to the triassic formations in other parts of the continent. This was a period when the weakened crust was unable to withstand the upward pressure of the molten rock and it burst through making long ridges or dykes. The original amount of this material must have been enormous, as it can now be found as drift extending south over the province to the Atlantic ocean. The Cornwallis sandstone, like other red rocks, contains no fossils, but its age can be inferred as above from its relation to the trap.

The rock of the South Mountain is a hard shale, for the most part often carrying veins of quartz. Quartzite also occurs in large masses in the vicinity of White Rock and stretches across the Gaspereau, making rapids in that river. In Webster Brook, two miles south of Kentville, in fawn-colored slates, *Dictyonema Websteri* is found, probably Cambrian, and on Canaan Mountain, one mile further south, Silurian encrinites may be obtained. The ridge south of Wolfville contains no fossils, and the mountain still further south is also barren, but a little to the eastward the brooks running into the Gaspereau show in their beds abundance of plants, *lepidodendrids*, *sigillarids* and *calamites*. These fossiliferous rocks continue to the extreme east of the county, Horton Bluff, and are probably sub-carboniferous, though some of the western series may be Devonian. In the eastern part of the town of Wolfville, running south from the dyked marsh to the top of the ridge and reappearing on the south of the Gaspereau River, is a deposit of varying width known locally as "Wickwire Stone." It is a coarse friable sandstone or fine conglomerate, the sharp grains of quartz being held together by a red cement of ferric oxide. It is largely quarried, being the principal material used for the foundations of buildings in this

vicinity. It some instances it resembles the triassic sandstone, but differs from it in containing no calcium carbonate. I have traced this formation to within a short distance of the shale but have not been able to observe the junction of the two. Its age has not been accurately determined, but it may be sub-carboniferous.

#### EVIDENCES OF GLACIATION.

Drift material from the North Mountain abounds on the South Mountain, being especially plentiful in the gulches and beds of brooks. This is mainly Amygdaloidal trap, which, notwithstanding its tendency to decompose through weathering, is found in somewhat large masses. In Wolfville, it is found in the soil to a considerable depth, especially along the line of a former beach. I have also found small boulders of syenite and diorite, which must have come from the Cobequid Mountains, as they resemble the rocks found in that range, and are unlike any country rock I have seen on this side of the Minas Basin.

#### STRIÆ.

On the summit of the ridge south of Wolfville, in the hard, fine-grained shale exposed on the side of the highway, parallel markings may be seen in different places, evidently glacial striæ. I have also observed coarse markings on a freshly exposed surface of Wickwire stone. These scorings all trend in a south-easterly direction.

#### EVIDENCES OF ELEVATION AND SUBSIDENCE.

The encrinites found on New Canaan mountain indicate that that formation was at one time covered by the sea, but its present altitude is probably due to the upthrust of the mountain range as distinguished from elevation over large areas. There is good evidence, however, that the sea was at one time nearly 50 feet higher than at present in an old beach formation, extending along the line of Acadia Street, parallel to the present water frontage. This, wherever dug into, presents a similar structure of rounded stones, evidently well worn by attrition. Immediately to the south of this, and at a higher elevation, is a

deposit of clay, while in front, about thirty feet lower, is a deposit of fine sand. The rounded stones in this old beach are mainly trap, so that the formation is of comparatively recent origin, probable Quarternary. At this time the sea must have covered the whole of the Cornwallis and Annapolis Valley.

There is also evidence that the land must have been at one time considerably higher than at present, for on the northern side of Long Island, about thirty feet below high water mark, are the remains of buried trees, *in situ*, the stumps, roots, and even trunks well preserved. This would call for a subsidence of 40 to 50 feet.