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The Effects of Glaciation in the Vicinity of Wolfville, N. S.

—By Frederick C. Churchill, Wolfville, N. S.

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About a mile east of Wolfville post office there lies a gorge occupied by a small brook, the waters of which flow northward into the Minas Basin and thus drain part of the Wolfville ridge.

This valley, called Evan's Gorge, runs at right angles to the Gaspereau River. The tiny brook begins its flow at the summit of the ridge, and as one looks to the south towards the Gaspereau he will see only a slight depression without any stream. Down this slope a little surface or sheet wash finds its way to the river below, and the hillside is more or less swampy, being kept moist by springs.

Looking northward from the water-shed, the head of the gorge is surrounded by a basin-shaped depression, cut in the arkosic sandstone of the Horton Series which underlies this region. An escarpment of sandstone crosses the head of the gorge, at the crest of the ridge. Here the perpendicular drop to the bottom of the valley is about fifty feet, and it seems reasonable to suppose that this escarpment was at one time the location of a waterfall when the valley was occupied by a larger stream than the present one.

This basin-shaped depression is now the site of a stagnant pool, almost entirely fed by springs and well filled by vegetation adapted to such places. Continuing north and along the valley, we see overlapping rock spurs for several hundred feet, and throughout this distance it has a zigzag course, both facts point-

ing to a stream-cut valley. As we advance northward towards its mouth, it gradually grows wider and finally ceases, the brooks flowing over a gently sloping surface. The length of the gorge is about 3,500 feet and its width averages about 350 feet.

Throughout its entire course, it is free from drift, which is so common in this locality. Near its mouth a well-defined moraine may be seen, which will be described later.

During my many examinations of this gorge I noted the following evidences which seem to support the theory that this valley was cut by a rapidly-flowing stream, and that the time was not sufficient to allow it to become adjusted to the underlying rock structure. Here rocks dip about twenty degrees in a northeasterly direction, and as the stream runs nearly parallel to the strike it may thus be considered a strike valley. When strike valleys develop normally and are adjusted to the geological structure, one side is steep and the other side has a gentle slope; but here we find that both sides slope alike, and this seems to show that the gorge was cut out rapidly and, therefore, not adjusted. Here the sandstone is very soft and easily eroded.

Judging from the direction of the valley, the location of the moraine, and the fact that the head of the gorge is the lowest point on the Wolfville ridge with the exception of a place south of Grand Pré, where a similar gorge exists, it appears that this valley may have been a spill-way of the Gaspereau River. If the Gaspereau was ever dammed by glaciation, this gorge would naturally carry off the overflow, and after the retreat of the ice would dwindle to its present size

It seems hard to believe that the present watershed of the Wolfville ridge could supply enough water to cut a valley of this size; and moreover if this were true, the valley would have been cut more slowly and would show a normal development.

The moraine that lies to the northwest of the mouth of the gorge is about sixty or seventy feet above sea level, and contains a little boulder-clay and many huge boulders weighing several tons down to the smallest rock fragments. Here may be seen trap from the North Mountain, sandstone, shale, and other rocks, lying in a confused heap. None of these rocks have been transported from any great distance; the trap had the longest journey, about twelve miles. These boulders are characteristic of glaciation, having a flat smooth side with rough edges, and many are well striated.

Boulder-clay is not very abundant and was probably washed to lower levels. This confused mass of rock rubbish was well washed over by the waters of the Basin when the land stood relatively lower after the final retreat of the ice sheet.

The glacial striæ in this locality are quite numerous on the slates that lie to the south, and show that the ice movement was south ten degrees east. About a half-mile south of Wolfville the hills are terraced, and these have frequently been mistaken for raised beaches. Upon examining these, one will find gravel and loose pebbles, but they lie in confused heaps and are not stratified. Here the boulder-clay is very deep, and these terraces mark the places where the ice dropped its load as it smoothed out the clay during its journey. These terraces are conspicuous bits of topography and are found 200 to 300 feet above sea-level.

South of Grand Pré the hills are frequently drumlin shaped, having a gentle slope to the north and steeper on their south side. These prettily-rounded hills are carved out of till, and are true monuments of glaciation.