

Turning now to the consideration of the fossils found in the drillings, the fragments of crinoids and the *Pterinea*? are of but little service in the determination of the horizon of the beds. The *Coleolus*? is very like a form that is common in the *Stringocephalus* zone at various exposures on the shores of Lakes Manitoba and Winnipegosis, and would thus indicate to some extent a Devonian horizon. The fragments of *Chonetes* are too imperfect to allow of the specific identification of the species, but as in several specimens the hinge-line is preserved they leave no doubt as to the genus. This genus in America ranges from the Clinton, or base of the Niagara, to the Carboniferous, but is most common in the Devonian. In Manitoba two species are locally abundant in the shales and argillaceous limestones of this latter system, while none have been found in the Silurian. This also points strongly to the Devonian age of the red and grey shales at Morden, and makes it quite certain that they are not older than the Niagara. As far as is known, however, the Niagara formation consists entirely of light grey limestones and dolomites, without any sign of red or grey shales, and unless the character of the rock changes very greatly as it is followed from north to south, the shales penetrated in the Morden well would not belong to this formation.

It remains therefore to consider the Devonian affinities of the beds in question. From the well at Rosenfeld, twenty-four miles east of Morden, Dr Dawson has recorded a thickness of 352 feet of red and grey shales, etc., at the top of the Palæozoic section, but from these drillings no determinable fossils were obtained. Below these shales no dolomites were met with, and no rocks that could be supposed to represent the Middle Devonian dolomites. The shales from the Morden well appear to represent a portion of this Rosenfeld series, and the absence of the *Stringocephalus* zone seems to indicate that these beds represent a lower horizon. The inference is therefore very strong that they lie below the *Stringocephalus* zone, and represent the basal shales of the Devonian, which have been eroded away and have left no salient exposures in the lacustral area to the north. It has been seen, too, that in the lacustral area the strike of the contact of the Devonian and Silurian runs in a fairly straight line N. 25° W., and this line being extended from the southeast angle of Lake Manitoba, would cross the international boundary line a few miles west of the Red river. A south-westerly dip from this line at a hypothetical elevation of 810 feet, the elevation of Lake Manitoba, at the rate of 10 feet to the mile, probably about the true dip of the beds here, will bring the top of the Silurian 300 feet above the sea at Morden, or 75 feet below the present bottom of the well.

BORING ON VERMILION RIVER.

This boring was sunk by the Manitoba Oil Company on the west bank of the Vermilion River, a short distance below the crossing of the Strathelair and Lake Dauphin trail, in township 23, range 20, west of the principal meridian.

In the spring of 1887 a percussion drill was hauled north from Strathelair station, on the Manitoba and Northwestern Railway, and the well was drilled to a depth of 292 feet, when an accident happened to the machinery which delayed the work for a time.

In the following year the drill was moved a short distance farther down the valley, work was resumed, and a final depth of 743 feet was reached.

From a comparison of the sections, the second well is found to have been begun nine feet lower, geologically, than the first, and therefore the levels of all the specimens