pyroschists in question yield, like coal and lignite, little or nothing to these liquids.

"It is the more necessary to insist upon the distinction between lignitic and bitumenous rocks, inasmuch as some have been disposed to regard the former as the source of the bitumen found in nature, which they conceive to have originated from a slow distillation of these matters. The result of a careful examination of the question has, however, led us to the conclusion that the formation of the one excludes more or less completely that of the other, and that bitumen has been generated under conditions different from those which have transformed organic matters into coal and lignite, and probably in deep water deposits, from which atmospheric oxygen was excluded. Thus in the palæozoic strata of North America we find in the Utica and Hamilton formations, highly inflammable pyroschists which contain no soluble bitumen; and the same is true to a certain extent of some limestones, while the Trenton and Corniferous limestones of the same series are impregnated with petroleum or mineral pitch, and, as we shall show, give rise to petroleum springs. The fact that intermediate porous strata of similar mineral characters are destitute of bitumen, shows that this material cannot have been derived from overlying or underlying beds, but has been generated by the transformation of organic matters in the strata in which it is met with. This conclusion is in accordance with that arrived at by Mr. S. P. Wall, in his recent investigations in Trinidad. He has shown that the asphalt of that island and of Venezuela belongs to strata of the tertiary formation (of upper miocene or lower pliocene age), which consist of limestones, sandstones and shales, associated with beds of lignite. The bitumen is found not only in the famous pitch lake, but *in situ*, where it is confined to particular strata, which were originally shales containing vegetable remains. These have undergone 'a special mineralization, producing a bitumenous matter instead of coal or lignite. This operation is not attributable to heat, nor of the nature of a distillation, but is due to chemical reactions at the ordinary temperature, and under the normal conditions of climate.' He also describes wood partially converted into bitumen, which last, when removed by solution, leaves a portion of woody tissue. (Proc. Geol. Soc., London, May, 1860.)"

The results of boring for petroleum in Enniskillen have developed some curious facts in relation to the supply of oil, wholly unexpected and extremely perplexing. The sudden stoppage of a number of flowing wells, is a new feature, well calculated to cause some degree of alarm among the well-owners and refiners, but not to such an extent as to favor the expectation entertained by many that the supply is about to fail.

The cause of the cessation is, in some instances, to be attributed to the exhaustion of the motive power which forced the oil to and above the surface —namely, the gas and vapours of hydrocarbons, which accompany the oils; in others, this cannot be the true explanation, for salt or brackish water continues to flow with diminished force. And, in other cases, gas alone has been observed to issue from the pipe without water or oil; but more frequently intermittent jets of salt water, mixed with petroleum and gases. Another curious fact has been observed with reference to the depth of the wells from which the present supply of petroleum is obtained. It is the deepest wells which have failed—namely, those above 200 feet in the rock; whereas others not more than 150 to 180 feet deep still continue to yield a stream of diminished force.* Wells situated within a few yards of one another are not equally productive; and borings have been made between two flowing wells a short distance apart, without touching the fissure or cavity containing the petroleum which supplied its neighbors, thus showing within what narrow limits the chances lie of striking a productive "vein of oil."

That the rocks in which the flowing wells are situated are not saturated with petroleum is shown by the occurrence of layers of rock destitute of any trace of this substance, and, consequently, impervious to it. If the Corniferous limestone is the source of the petroleum in Enniskillen, it is quite possible that a rich supply will be found at the junction of that rock and the overlaying Hamilton shales, into the cracks, cavities, fissures or joints, of which it has risen by its superior levity. But this will only be in certain localities; for a well has been sunk at Petrolia upwards of 300 feet in the rock, probably through the Hamilton group to the Corniferous limestone, and only intermittent supplies of petroleum and salt water have been obtained.

The question which has to be determined is the depth or thickness of the Hamilton shales in the township of Enniskillen. This formation in the middle of the State of New York is 1,000 feet thick, but they thin out rapidly to the west, so that on the south shore of lake Erie they are not 500 feet thick. On the banks of some of the tributaries of the Sable river, north of Enniskillen, Mr. Murray found a "nearly complete section of the Hamilton

* A very interesting paper on the Oil Wells of Enniskillen was read before the Canadian Institute on February 28th, by Sandford Fleming, Esq., C.E. It will be published in the next number of the *Canadian Journal.*