group," and he gives the thickness at 133 feet. The thickness of these rocks in Enniskillen may be from 150 to 180 feet. They are distinguished in the State of New York by the remarkable extent and regularity of the joints which intersect the strata. This tendency to a *jointed structure* may have a great influence on the accumulation of petroleum in these rocks. The joints would run in the direction of the anticlinal axis, or, to use a more familiar expression, they would follow the course of the upheaval which has elevated and arched the rocks from lake St. Clair to London, and thence towards and beyond Hamilton.

The organic remains found in the Hamilton shales and in the Corniferous limestone, may furnish some clue to the source of the petroleum in these rocks. In the Hamilton beds, the evidence of verdure over the land is no longer doubtful, according to Dana. The remains show that there were trees, and of large size. The plants found in them belong to the Lycopodia (ground pine) of modern damp woods. The earliest representatives of the type had trunks a foot or more in diameter, and may have been more than a score of feet in height. The orders of sea weeds are common, and one of them is sometimes a foot in diameter. The waters were marine, and the seas shallow. But it is in the Corniferous limestone that we find the most extrordinary distribution of life. The Upper Helderberg series, to which the Corniferous belongs, "is eminently the coral-reef period of the Palæozoic age."* Many of the rocks abound in corals, and are as truly coral-reefs as the modern reefs of the Pacific. The hornstone from which it derives its name, contains spiculæ of sponges, and Desmids or small microscopic plants. Protophytes are abundant throughout it. The hornstone of this rock is analogous to flint in origin as well as in its mode of occurrence. Hence, besides a vast profusion of corals in the Corniferous period, we have the organic origin of the hornstone indicating an extraordinary distribution of life. From these sources—namely, Corals and Desmids, petroleum may have been produced by slow decomposition, as in the island of Trinidad, in more recent epochs.

The exact thickness of the Corniferous limestone in Enniskillen is unknown; but it can be approximately estimated. In some places in New York the thickness of the series is 350 feet, but generally they do not exceed 70 feet. In Monroe county, Michigan, the thickness is 60 feet; but as it is probable that this limestone in Enniskillen, being situated in a geological depression running across the anticlinal, may not have been subjected to so great denudation as in Monroe county. The Corniferous limestone in Michigan is particularly bitumenous. It is also extensively intersected by divisional planes; and at a quarry in Monroe county, petroleum is so abundant as to exude in the form of a natural spring, and float on the surface of the water. This series of rocks in Canada does not probably exceed in and near Enniskillen 200 feet in thickness.

In boring a test-well for oil at Enniskillen, if a spring of petroleum were not touched in one or more of the joints in the Hamilton shales, where it has probably accumulated, a depth of 400 feet in the rock would reach the surface of the Onondaga salt group; and expectations are entertained by some that brine of great strength would be found in place of oil, and thus lead to a new industry, equally profitable with that of petroleum, as is now in process of development in the neighboring State of Michigan. But the geological features of the two areas are widely different, and it is doubtful whether the brine of Enniskillen could compete with those of the natural but ancient salt lagoons of that State.

The prolific salt wells at Syracuse and Salina, in the State of New York, are sunk in this rock to the depth of 150 to 340 feet, and they yield one bushel of salt from 35 to 45 gallons of water, whereas it requires about 350 gallons of sea water to obtain the same result. The physical geography of the area occupied by the Onondaga salt group in New York is thus described by Dana:—"The position of the saliferous beds over the State of New York indicates that the region which, in the preceding period, was covered with the sea and alive with corals, crinoids, mollusks and trilobites, making the Niagara limestone, had now become an interior shallow basin, or a series of basins, mostly shut off from the ocean, where the salt waters of the sea, which were spread over the area at intervals—intervals of days or months it may be—evaporated, and deposited their salt over the clayey bottoms. In such inland basins the earthly accumulations in progress would not consist of sand or pebbles, as on an open sea coast, but of clay or mud, such as is produced through the gentle movements of confined waters." Brine springs are not necessarily associated with the Onondaga salt group, as the foregoing conditions involved in their occurrence show; and they would be found in the greatest abundance near the shores of the ancient sea in which those rocks were deposited. Generally brine springs occur near the outcrops of formations, except, as in the case of Michigan, where a geological depression has occasioned the accumulation of salt in the interior of the basin which is so characteristic of the physical structure of that State. The

* Dana.