THE BOILING LAKE OF DOMINICA.

Dominica, the most mountainous of the Lesser Antilles, is about thirty miles in length by sixteen in breadth. The physical formation of the island is indescribably rugged, and the scenery generally is of the most varied and beautiful character. The highest mountain, Morne Diablotin, is 4,533 feet above the level of the sea, or a little higher than Ben Nevis, in Scotland. There are several large rivers in the island, but its interior is still little known, although nearly 400 years have elapsed since the discovery of the island by Columbus.

A correspondent of the *Illustrated London News* relates the discovery of the boiling lake, and the details of a recent journey to that remarkable place:

"We stood upon a large plateau of about fifty acres in extent, which is in reality a small spur of what have since been called the Sulphur Hills. Here and there over this plateau, on the surface of which is no vestige of vegetation, were huge-charred trunks of trees, large masses of volcanic rock, and numberless blow-holes, ejecting steam and water. The water, collecting from all sides, formed in the center of this scene of desolation a milk-white, impetuous stream, discharging itself over the edge of the plateau into the precipice beneath.

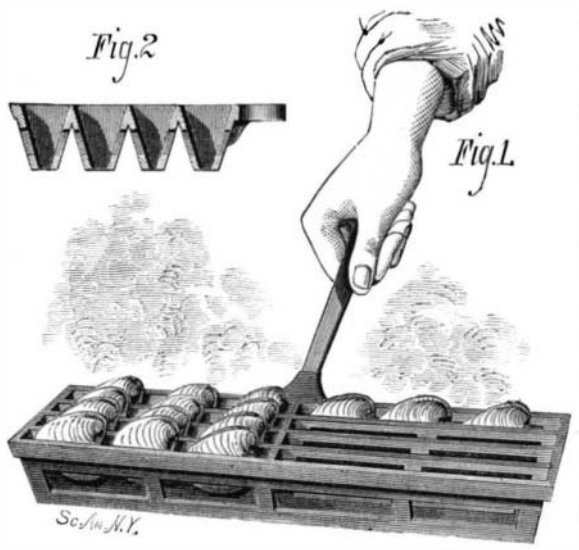
"Picking our way cautiously over this volcanic bed of scoria, pumice, and sulphur, and jumping from rock to rock, which here and there protruded from the stream, we crossed a firm mound of earth beyond, and unexpectedly found ourselves at the edge of the Boiling Lake. It was thus on March 2, 1875, that the Boiling Lake was seen and closely examined by Dr. Freeland, a Scotch medical practitioner, Captain Gardyne, who was traveling with him, Dr. Nicholls, a medical practitioner in this island, and myself.

"Here, then, at an elevation of about 2,400 feet above the level of the sea, and on the southern side of the Sulphur Hills, is the Boiling Lake of Dominica. It is a body of pale slate-colored boiling water, inclosed in a circular basin of about 150 yards in width, the sides of the basin being, I should say, about 60 feet in height. The bare summits of the Sulphur Hills rise about 500 feet above the edge of the basin, and from blow-holes in the side of the hills issue small quantities of water, which in their downward course to the lake form two tributary rivulets.

"On arriving at the edge of the basin one sees nothing but clouds of steam rising from the lake. But the noise of the boiling water is distinctly audible, and it is only when a passing breeze for a moment dissipates the cloud of steam that one sees boiling in vast bubbles the body of water at one's feet. The actually boiling portion of the lake must be in a circle of about 40 feet in diameter, and the bubbles rise, I should say, about 3 feet or 4 feet into the air. The ripples caused by the boiling break towards the surrounding shore until they lave the sulphur-coated stones at the water's edge. The water itself, it is curious to observe, has, near the shore, a circular motion, which, perhaps, to some extent, accounts for the shape of the lake's basin; for I noticed that a small log thrown into the water traveled round the lake, passing and repassing the spot at which it had entered the water. The only apparent exit to the lake is on the southwestern side, and is not unlike a railway cutting—say about 9 feet in width. The amount of water discharged through this exit is apparently very small; but on closer examination I noticed an extensive sub-surface drainage, which, at about 200 yards south of the lake, forms a beautiful waterfall."

IMPROVED CLAM BAKER.

The implement illustrated herewith is a handy contrivance for baking clams in their shells. It holds the clams so that all the juice is retained, and enables the baking to be more expeditiously and conveniently done. The device consists simply of a rectangular iron frame, the sides of which are downwardly and inwardly inclined, so that the bottom is narrower than the top. In said frame are arranged V-shaped bars, as shown in Fig 2, which have cavities in their under sides, so that the heat is more quickly distributed to the clams when placed over the fire. This construction also allows of the implement being cheaply made of sheet metal.



STROUB'S CLAM BAKER.

In use the clams are placed as shown in Fig. 1, with the edge or mouth of the shell downward and wedged in between the bars, so that the bivalve cannot open while being cooked. The whole is then placed over the fire, and left without further attention until the baking is accomplished. Patented January 22, 1878. For further particulars address the inventor, Mr. John L. Stroub, New York city, N. Y.

Charles Frederick Hartt.

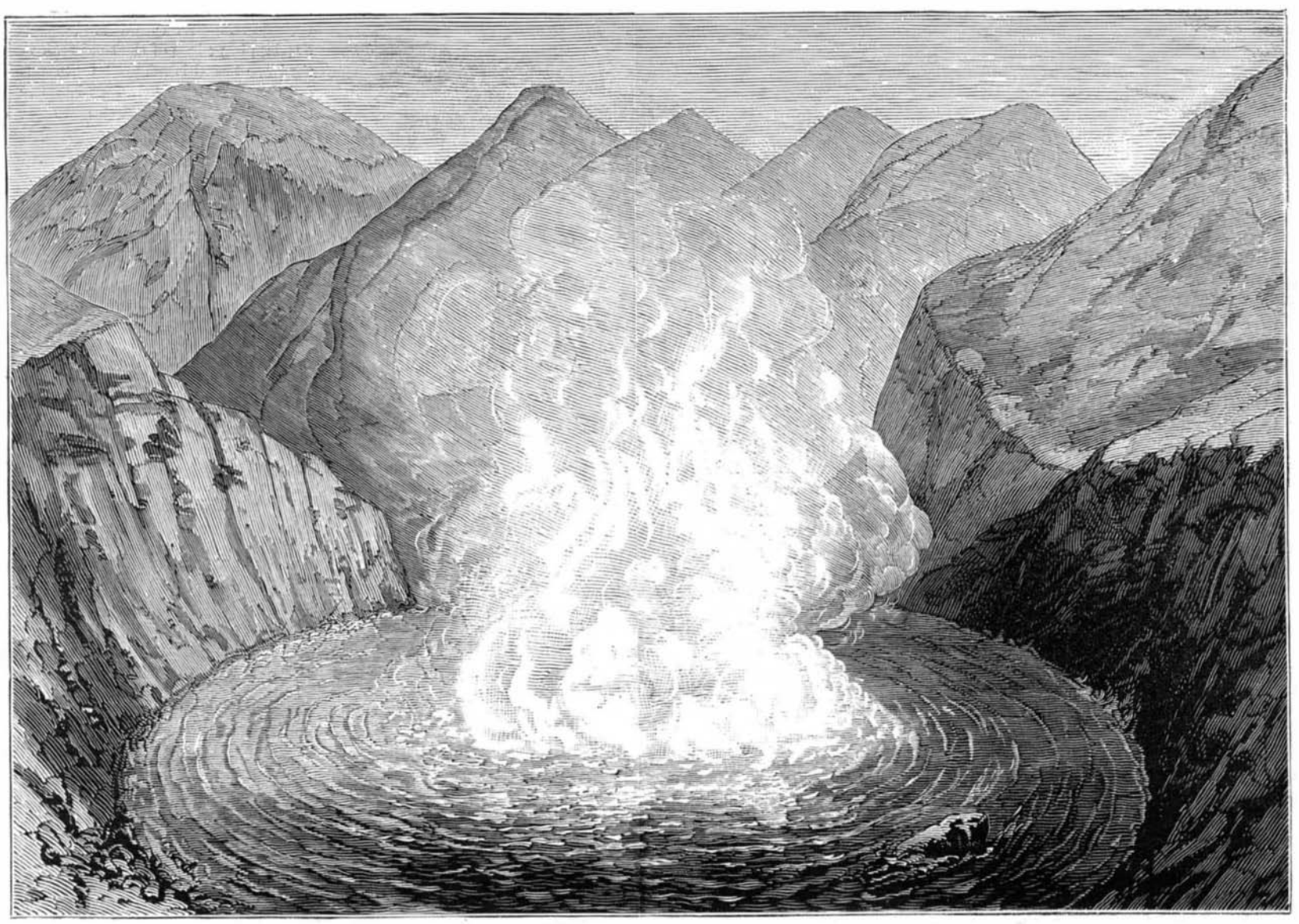
The loss which the world of science, but a few months ago, suffered in the death of Professor Orton, while engaged in South American exploration, has recently been supplemented by that of Professor Charles F. Hartt, Chief of the Geological Survey of Brazil. Professor Hartt was born about 1838, at St. John, N. B. In his youth he became interested in the study of geology, and discovered at St. John many new fossil plants and the oldest specimens of fossil insects then known. Most, if not all, of these were named and described by him in Dawson's "Arcadian Geology." From 1862 to 1865 he studied under Agassiz, and accompanied the latter to Brazil as geologist of his expedition. Shortly after his return he succeeded Professor Tenney to the chair of Natural History of Vassar College, which he resigned to accept the Professorship of Geology and Physical Geography at Cornell University. From the time of his first visit to Brazil, he made the geology of that empire his special study, and returned thither three times; in each case making careful explorations of the northern provinces and the valley of the Amazon. In May, 1875, the Emperor placed Professor Hartt at the head of the Geological Survey of Brazil, with a most liberal salary. The results of this great work have been but partially published. He was an untiring worker, and the results of his labors, although extensive, might have been still more so had he not been hampered through the jealousy of his native assistants during the absence of the Emperor in America and Europe. In 1870 he published his chief work "The Geology and Physical Geography of Brazil."

It is rarely that we find a specialist so versatile as was Professor Hartt. To his accomplishments as a geologist were added those of an ardent archæologist, artist, and linguist. He learned a new language with amazing rapidity, and the idiom of his adopted country was as familiar to him as that of the land of his birth; while his researches into the structure and affinities of the Indian languages of South America were profound and accurate. It is a singular fact that in the death of Professor Hartt, Vassar College loses, within a year, the only three professors who have filled the chair of Natural History in that institution, the other two being Sanborn Tenney and James Orton.

To Exterminate the Red Ant.

Professor Leidy states that when he purchased his present residence, while it was undergoing repair, he noticed a fragment of bread, left by the workmen in one of the second story rooms, swarming with little red ants.

Apprehending that the house was seriously infested, to ascertain whether it was so, he placed a piece of sweet cake in every room from the cellar to the attic. At noon every piece was found covered with the ants. Having provided a cup of turpentine oil, each piece was picked up with forceps, and the ants tapped into the oil. The cake was replaced, and in the evening was found covered with ants. The same process was gone through the following two days, morning,

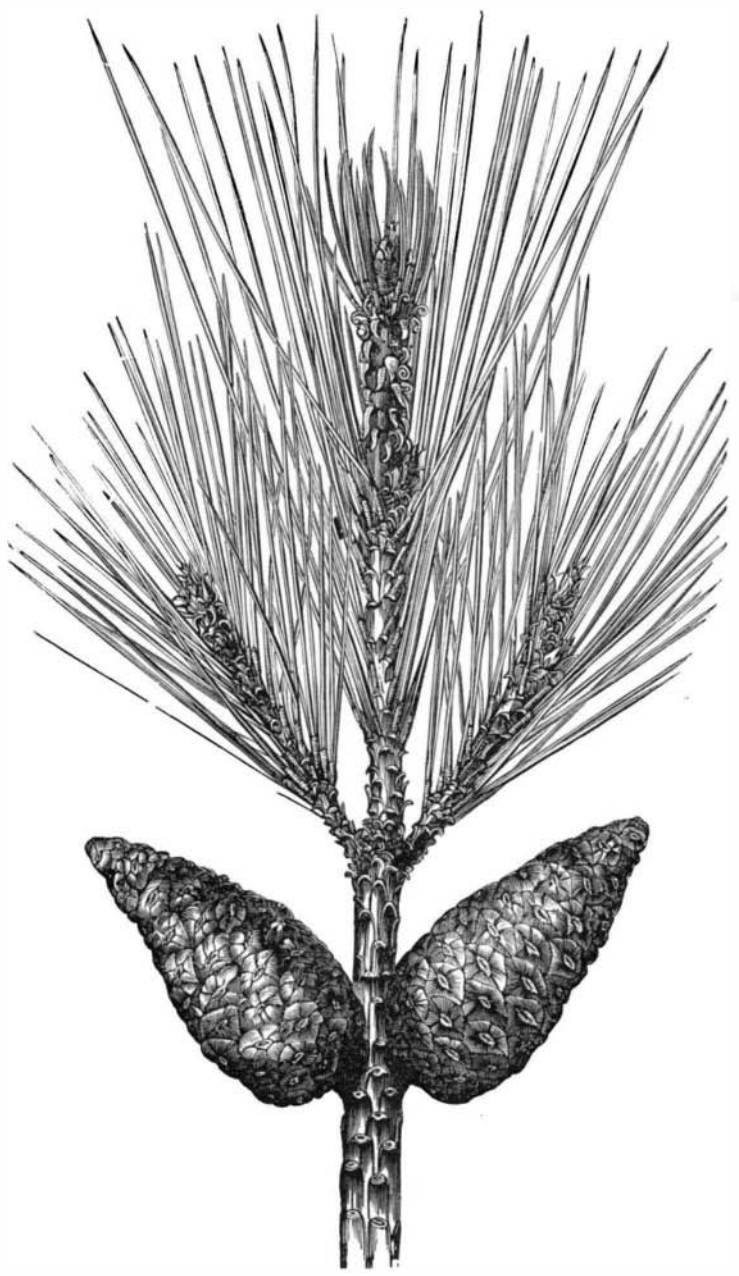


THE BOILING LAKE OF DOMINICA, WEST INDIES.

noon, and night. The third day the number of ants had greatly diminished, and on the fourth there were none. He at once concluded the ants had all been destroyed, but in the attics he found a few feeding on dead house flies, which led him to suppose that the remainder had become suspicious of the sweet cake. He accordingly distributed through the house pieces of bacon, which were afterwards found swarming with ants. This was repeated with the same result for several days, when, in like manner with the cake, the ants finally ceased to visit the bacon. Pieces of cheese were next tried, with the same results, but with an undoubted thinning in the multitude of ants. When the cheese proved no longer attractive, recollecting the feast on dead flies in the attic, dead grasshoppers were supplied from the garden. These again proved too much for the ants, and after a few days' trial neither grasshoppers nor anything else attracted them. They appear to have been thoroughly exterminated, nor has the house since been infested with them. Professor Leidy regards the action of the ants as indicating a ready disposition to become circumspect.

THE PYRENEAN PINE.

The foliage of this tree is very distinct, quite unlike that of any other conifer. The leaves are in twos, of a beautiful grass-green color, and from 6 inches to 7 inches in length. It can easily be distinguished from other pines on account of the deep yellow colored bark on its young shoots; the cones are about 2½ inches long, rather egg-shaped, on short footstalks, sometimes in twos, but mostly solitary. It is found on the Pyrenean mountains, where it forms extensive forests. This tree is highly ornamental, especially when young, its fine, upright-growing, light green leaves, and the orange colored bark on the terminal shoots being its most striking and beautiful features during that stage; but when older, it assumes a coarser habit of growth; its branches become stout, wide-spreading, and straggling, and altogether its general appearance is far from attractive. This pine has never been very extensively planted, on account of its scarce use in the trades, and the difficulty in procuring seed true to name. The wood is of inferior quality. We copy the illustration from the *Garden*.



THE PYRENEAN PINE.

Presence of Indigo in the Human System.

At a recent meeting of the Pathological Society, of London, Dr. Ord exhibited a specimen of a renal calculus containing indigo. He remarked that indigo, as well as a substance which yielded indigo blue under certain reagents, was sometimes met with in normal urine; but it had never before been met with in the form of a calculus. The specimen consisted of a black mass of the size of a half walnut, lodged in the pelvis of one of the kidneys. When heated on platinum foil it gave off a peculiar smoke, which had a sooty character; after incineration a small amount of a deposit of phosphate of lime was left behind. With the microscope, bluish-black masses and crystals could be seen; and after treatment with hydrochloric acid a black residue was obtained. On sublimation it yielded crystals in the form of six-sided tablets, just like indigo. After trituration with strong sulphuric acid, it gave a blue fluid, which finally had the spectroscopic characters of indigo, a single broad absorption band in the yellow and orange part of the spectrum. In regard to the formation of the substance, Dr. Ord stated that there had been nothing peculiar in the patient's food to produce it. Indol, which bears some relation to indigo, is formed by the action of the pancreatic juice and pepsones, and is present in the fæces. When indol is injected into the blood of a dog, indican appears in the urine. Now indican, richer in carbon and hydrogen than indigo, is decomposed by the action of acids into a mixture of indigo blue and glucine; and hence it is said that in this is to be found the reason of the presence of indigo in the urine of cholera, and in cases of obstruction of the passage of the fæces through the intestine. It is also found in pus, the greenish blue color of which is due to a substance allied to indigo. In the present case, pus contained in one of the kidneys may have been the source of the indican, which, being reabsorbed by the blood, was excreted by the other kidney, and precipitated as the colored indigo-blue by its contact with the acid urine. Whatever the explanation, it pointed to a direction in which the urine might be studied with profit. Dr. Thudicum remarked that the first urine of cholera contains a very large quantity of indican, so that the albumen in the urine is precipitated of a black color. But even if a substance was present only in a small amount, it was not, therefore, to be regarded of no importance, but the contrary.

RECENT experiments by Professor McNab on the rate of the ascent of fluids in plants, ascertained by the employment of spectroscopic examination of the diffusion of lithium citrate, gave a maximum result of 24 inches per hour

THE OIL BEARING SANDS OF PENNSYLVANIA.

The question as to the precise spot in which a well may be sunk with a sure prospect of "striking oil" is one of great importance to petroleum miners, and yet one which the most experienced and best informed oil men fail to answer with certainty; and, in fact, one that must await the completion of the present geological survey of Pennsylvania for its correct solution. Pending this result, however, Mr. Ashburner, one of the assistants of the survey, has, in a paper read before the Engineers' Club, of Philadelphia, given us some valuable information as to the rock formations and the relative positions of all the oil horizons of Western Pennsylvania, together with an estimate of the daily production of each horizon. That portion of the State in which petroleum has been found lies entirely west of a line drawn across the State, from its boundary at the southeastern corner of Greene County, to that at the northeastern corner of McKean County. The oil regions may be divided, for convenience of description, into three districts, the southwestern, the western, and the northern.

The southwestern district may be said to include that part of the State south of the Ohio river and west of the Monongahela river; the western, known among the producers as the "lower country," lies in the water basin of the Alleghany river, between Pittsburg on the south and the Philadelphia and Erie Railroad on the north; and the third, or northern district, lies entirely north of the Philadelphia and Erie Railroad, in the counties of Warren and McKean, and extends ten miles into the State of New York.

The strata of Western Pennsylvania lie comparatively horizontal, and their average dip from Bradford, near the State line, to Pittsburg, is about eighteen feet to the mile. Three thousand feet of the stratified rocks of the Carboniferous and Devonian ages in Pennsylvania have been found to contain petroleum. The highest stratum in which oil is found occurs in the coal measures, 165 feet below the Pittsburg coal seam, in Greene County; while the lowest occurs about 3,200 feet below the geological position of the Pittsburg coal seam in McKean County. If we should drill a well in Greene County 3,200 feet deep, starting on the Pittsburg coal, we would pass through the horizon of all the sands and sandstones in which the petroleum of the State has been found. The rocks are subject to very marked and rapid changes in their thicknesses, in comparatively short distances. What the changes in thickness may prove to be between McKean and Greene counties is not yet known; nor is it easy to say whether the total thickness of the stratified rocks between the Pittsburg coal and the "Sartwell" (or lowest) horizon will be found of a variable quantity, or much greater or much less than the above estimate at localities between the two counties.

The petroleum in the southwestern district comes from the highest rocks. The "oil-sand group" of this district is about 800 feet thick, and is composed of three sandstone members, separated by intervals containing coal seams, slates, and shales. The first, or upper, oil sandstone, 260 feet thick, shows considerable variation, and is often replaced by shale; in such cases the shale contains no oil. The second, or Mahoning, sandstone is quite constant in thickness, 135 feet being the average. It is the principal repository of the petroleum of the southwestern district. The third, or lower, sandstone is made up of three members, separated by about thirty or forty feet of shale and coal. The thickness of the whole is about 400 feet. The upper member is regarded as the oil bearing rock; the lower is the representative of the coal conglomerate or millstone grit. Some of the features of this district are very different from those of the other two. Small crevices in the oil sands are of frequent occurrence; and it is a striking fact that the oil is said never to have been found except where a crevice has been so struck. By some this feature has been considered a necessary one to the original production of the oil. Professor Stevenson, however, states that the oil in nowise owes its origin to a disturbance of the strata, but that the only effect of the latter has been to provide reservoirs for the oil in the rock already oil bearing. Between the bottom of the coal conglomerate (the lowest member of the lowest oil-producing sandstone of the district under consideration) and the "first oil sand" (the highest producing sandstone of the western district) there is an interval of from 650 to 700 feet of shales and sandstones, forming the barren oil measures, or mountain sand group. These rocks are perfectly destitute of any economical strata, containing no coal, iron, or oil.

The petroleum producing sands of the western district are found intermediate between the high rocks of the southwestern district and the low rocks of the northern. The total thickness of the group is 315 feet, and consists of three strata separated by two intervals of 105 feet and 110 feet respectively. The first sand produces a heavy lubricating oil, of from 30° to 35° gravity; the second, an oil of about 40°; and the third, the usual light oil, of from 45° to 50° gravity. The latter sand is the most productive, and yields most of the oil of commerce. The well records along the "green oil belt," in Venango County, show great uniformity in the arrangement of the sand rocks, being sharply defined, massive, and lying at regular intervals. Going southeast from this belt, they gradually split into several members, becoming finer and finer in their composition, and shade off into shales. Going to the northwest, the third sand terminates quite abruptly; the second sand overlaps it and continues a mile or two farther; the first sand overlaps the second, and extends in some places a long distance beyond. Most of the wells producing from the first and second sands are located along these overlapping edges of the sand rocks. Wherever the lowest sand is adapted to the production of oil, the main deposit is found in it, and not in the sands above. The first and second sands do not produce oil along the center of the belt. In some wells oil has been obtained from all three of the sands; but in such cases the wells are not on the axis, but near the edge of the third sand; and but a short distance farther from the center no third sand can be found. These facts are suggestive, and seem to point to the conclusion that the oil sands are merely reservoirs which have acted as sponges in absorbing the oil that has ascended from a much greater depth. In such a case the oil would not be a product of the rock in which it is found.

The petroleum of the northern district comes from the lowest rocks. Between the "third oil sand" of the western district and the Warren sand of the northern district there is an interval of about 600 feet of shale, which is entirely barren. The Warren oil sand is very irregular in character, and the oil is found at horizons varying from 600 to 800 feet below the Venango third sand. In quality it very much resembles the "third sand oil." By many of the producers it is known as "slush oil," on account of the poor quality of the sand, and the rapid diminution of the product of the wells, which yield largely when first struck. The productive horizon of the Bradford oil belt in McKean County and Cattaraugus County, N. Y., occurs probably 300 feet, more or less, below the Warren horizon. The sand in this belt is of a finer and closer texture, and is more constant in character over a wide area than that of any other producing belt in Pennsylvania. This belt is the surest and safest territory in which to operate. The oil is of about the same gravity as that of the "third sand oil," but somewhat different in character. On account of these differences in the sand and oil, the Bradford wells are never pumped continuously, but "by heads," or at regular intervals. This is found necessary to keep the sand open or porous. A great deal of the oil obtained from the Bradford belt, along the State line, is found several hundred feet above the regular producing sand. The lowest oil of the northern district, and in fact in Pennsylvania, comes from the "Sartwell oil sand," but recently discovered in Liberty Township, McKean County.