

GENESIS OF OILS

How Nature Makes and Stores Petroleum.

ARE FIELDS NEAR PORTLAND?

Indications Point to the Existence of Oil Not Far Away—A Little Information on a Very Large Subject.

Much talk about the existence of oil fields near Portland make the statement of some facts concerning the genesis of petroleum, the character of the strata in which it is found, and the indications of its presence of interest at this time.

Concerning the genesis of petroleum there are many theories, most of them very foolish, in keeping with the brains which brought them. The most reasonable, and the generally accepted scientific theory, is that the bitumens are derived from vegetation, deposited ages ago, in sedimentary strata, slowly changing to carbonaceous matter, to be afterward distilled by the intense heat of metamorphism. When vegetable tissue is buried deep in the ground, the elements arrange themselves into new products. The oxygen slowly unites with the carbon to form carbonic acid, leaving substances rich in carbon and hydrogen. It is in this way that coal, peat and lignite have been formed. Graphite and anthracite coals were produced by great heat, the volatile matter being vaporized, and probably after condensing, in porous and fissured strata, as bitumen, petroleum and the like. Petroleum is not found in the altered rocks. It is found in the unaltered rocks, the shales and sandstones, into which it has migrated. The accumulations of oil and gas in the domes and summits of the anticlines prove that the bitumens are migratory and that their general course is upward. This accounts also for tar springs and gas escapes.

Petroleum varies widely in smell, color and gravity. In the same oil field, in the same stratum, there are differences in the oils. These differences are due to several causes—to the different kinds of vegetation from which the petroleum was distilled; to different temperatures in the process of distillation; to different degrees of pressure; to the varying rapidity of distillation; to the presence of different substances during distillation, and other causes.

Character of the Oil-Bearing Strata.
Oil must be looked for in the unaltered rocks, such as shales and sandstones. Anticlines exercise a great effect upon the accumulations of petroleum and gas. When strata are bent into curves the upward curve is an anticline, the downward a syncline. It is in the anticlines that one must expect to find oil and gas. A quaquaversal is a dome-like elevation along the axis line of the anticline. When a formation contains permanent water, oil and gas will be found in the summit of these domes. The water being heavier is at the bottom, the oil next on top and the gas, being lightest, on top of the oil. Where there have been great uplifts, the tops of the anticlines are often worn away, and the oil will be found to have drained into the dips. Anticlines are often faulted. If an oil-bearing bed ascending, say, eastward, be faulted by a north and south fault, the ascent of oil will be stopped. In that case there will be plenty of oil on the west side of the fault, and there the well should be bored. On the east side of the fault there will be only water.

The petroleum is held in the porous rocks by a cover or incasement, which usually consists of shale or some other fine-grained rock, in which is water. When water has taken possession of shale and similar rock, it is almost impossible for oil to eject the water and form a passage. Vice versa, it is very difficult for water to eject oil from a shale of which it has taken possession. The bitumens also, by hardening on the surfaces of deposits, form an impervious covering to retain the oil.

Water plays a strong part in the formation of oil deposits. It is water that first, by removing the calcareous and silicious material, fits the sandstone to be the porous receptacle of the oil, and it is the buoyancy of water which impels the oil upward into the receptacle. Hot, silicious waters, upon cooling, also deposited silica in the shales, forming the so-called "shales," which are capable of holding the oils and gases imprisoned. If water did not float oil upward, little oil would ever be seen. In the anticlines the pressure of the water is from below, upward on the oil; and the pressure of the gas is downward. With all these forces confined, under immense rock pressure, it is little wonder that the oil often leaps out in a column 100 feet, and more high, when the drill has given it a little door of escape upward.

What has been said is not, of course, a complete history of the genesis of oil or of the characteristics of the strata. No newspaper article could fully deal with such an ample subject. But the facts stated will be of use to the prospector who desires to pursue his search intelligently. Of more general interest, perhaps, will be some hints concerning surface indications.

Indications of Petroleum.
These consist of seepages, fumaroles, leached shales, red shales, black shales, silicious, natural gas, traces of mineral springs, cracks in which bitumen occurs, etc.

Exposed bitumens are black and brown. They can be distinguished by their smell and taste. They melt in the fine of a match, and they readily dissolve in chloroform, turpentine or bisulphide of carbon, forming a black or brown solution.

Gas escaping is not always a certain indication of petroleum. The carbonated hydrogen burns with a yellow flame; sulphuretted hydrogen with a blue flame. Carbonic acid gas does not burn at all. Acetate of lead paper and blue litmus paper may be exposed to the gas to test it. If sulphuretted hydrogen, the acetate of lead paper will turn brown; if carbonic acid gas, the blue litmus paper will turn red. The prospector should learn how to make these simple tests.

In examining strata, the prospector should search in gulches, canyons and along banks of streams, for here he will find the best exposures. The surface should be examined, and any brown or black substances found should be tested to see if they are bituminous.

More frequently than not oil deposits are overlaid with leached shales and sandstones. These are, therefore, to an extent, good surface indications. Mineral springs are always found in company with petroleum deposits. Therefore, these springs, or indications of their existence, are indications, to a certain extent, of the presence of petroleum.

The dip of exposed strata and the depth

to which a well must be bored, can easily be ascertained by the clinometer. The strike of an anticline may be followed for a long distance, and justify boring even in territory that shows no surface indications of oil.

The personal of these hints will not make an expert, or even a good prospector of any one; but it will have a value to one who really desires to learn, and who is not afflicted with the notion that he can master a difficult study in a minute's reading. The oil expert and the oil prospector must supplement theory with much practice in the field.

Are There Oil Fields Near Portland?

There certainly are oil fields in Oregon. There is oil territory near Portland, both east and west of the city. This does not mean that all the land east and west of Portland is oil territory. Oil accumulations in natural reservoirs, and one piece of land may be rich in oil and adjoining pieces barren. If this were generally understood, some costly mistakes in boring would have been avoided. In the oil business, as elsewhere, ignorance and presumption are expensive. Within a few miles of Portland I have recently seen land pronounced oil land which is as innocent of oil as land can be. On the other hand there is land within a few miles of Portland which is unquestionably oil territory, and which will richly reward the capital that has the courage to drill there.

It is not at all likely that oil will be found by drilling in the valley close to Portland. The erosive forces, ages ago at work, have overlaid the rocks with conglomerate, and the drill would probably meet nothing but boulders and gravel debris to a depth of hundreds of feet. We must go back a few miles to find oil-bearing strata.

It is sincerely hoped that judgment will be exercised in the first development work in this field. Export assistance is much cheaper in the long run than the cheap advice of presumptuous ignorance. And I can conceive of no disaster worse than the failure of the first borings, and the consequent discouragement of capital, whereas success, following good location, would set Portland 10 years ahead in progress. Oil is a better and cheaper fuel than coal. It is hard to calculate the wealth and the increased manufacturing activity that will follow in the train of oil development. The first lot of oil that follows the drill will increase the real value of this country and city enormously.

If development work is sensibly done, a wise caution going hand in hand with a wise liberality, the oil fields adjacent to Portland ought to be supporting many flowing wells within the present year.

P. W. FRANCIS.

Portland, Jan. 31, 1901.

ROAD SUPERVISORS.

County Commissioners Make Two Changes in Eleven Men.

The Board of County Commissioners has appointed road supervisors for the year as follows:

W. J. Miller, Linton, district No. 1.
George Fritz, Sylvan, district No. 2.
E. H. Moses, 230 Front street, district No. 3.

J. W. Ryan, Hillsdale, district No. 4.
P. J. Kelly, Woodstock, district No. 5.
A. Cleveland, Gresham, district No. 6.
E. Littlepage, Pleasant Home, district No. 7.

Dave V. Hart, Peninsula, district No. 8.
Donald Mackay, Base Line Road, district No. 9.

Thomas Evans, Corbett, district No. 10.
Joseph Ellis, Latourell, district No. 11.

The changes are Dave V. Hart in place of J. E. Souffin, and Donald Mackay in place of John Conley. The road supervisors receive \$2 per day each, and 50 cents per day for a horse. No changes were made in the boundary lines of the road districts.

DRYDOCK ON COLUMBIA

REPORT OF BOARD OF NAVAL OFFICERS MADE PUBLIC.

Will Be Very Desirable When Improvement Projected for Mouth of River Shall Be Completed.

From the report of the naval officers appointed to examine into the desirability of locating a Government drydock on the Columbia River, the following is taken. The board was composed of Captain Henry Glass, Lieutenant Philip Anderson, and Civil Engineer Homer R. Stanford. They visited the Columbia River last July, spending four days in their examination. The report, aside from a lot of statistical tables and formal matters that have already been printed, sets forth:

"The mouth of the Columbia River is one of four points on the Pacific Coast of the United States which affords safe harbor for moderate draft shipping. It is the natural outlet for an immense productive territory, and as a shipping point is important because of its excellent through railroad communications.

"Its position, 500 miles from San Francisco, and the only available point between San Francisco and Puget Sound, makes it highly important, from a strategic standpoint, to have the Columbia River possible as a harbor of refuge and repair for naval vessels, more especially as the entrance to the Puget Sound naval station lies between shores, one of which belongs to another nation.

"The mouth of the Columbia, with the modern defenses established and appropriated for, is amply defended against any possible hostile force.

"The Columbia River, from a point about 15 miles above its mouth, is always fresh. Numerous mountain streams make available an abundant supply of potable water anywhere on the river.

"Amply railroad communication is found in a railroad on the south or left bank of the Columbia to the mouth of the river, near and beyond Astoria. By this railroad supplies can be received from all the great railroads leading in to Portland.

"Portland, the largest city in the extreme Northwest, is convenient to all points on the Columbia River, and is an excellent labor and supply center.

"The climate of the Columbia River is mild, with but little snow, and work at a shipyard could proceed without interruption throughout the year.

"In considering the advisability of establishing a drydock on the Columbia River, the depth of water on the river bar must be considered. The ruling depth of the bar channel, previous to the construction of the jetty, was from 20 to 21 feet. The jetty was commenced in 1886 and completed in 1888, when a depth of 31 feet was secured in the main ship channel at low water, 30 feet having been expected.

"A plan has been prepared and approved by the War Department for a continuation of jetty work, with the expectation of obtaining a 40-foot channel. For this purpose an appropriation has been proposed to make preparations for the proposed jetty extension, thus probably insuring the whole appropriation necessary for the complete improvement of the bar. With this work accomplished the Army engineers expect that at least 35 feet, and probably 40 feet, will be secured.

"It is also proposed to secure a depth of 35 feet at low water in the channel of the river from a point immediately above Astoria to Portland. The most serious difficulty existing at present is the shoalness of the channel from Tongue Point to Point Harrington, on the north shore, a depth of 17 feet only at mean low water.

being shown in some spots. This must be remedied before the river can be considered open at all times to vessels of deep draft.

"In view of the above, the board is unanimously of the opinion that while the present conditions exist, the benefit to be derived by the naval service would not warrant the expense of locating a drydock and the naval station which would result, and maintaining the same. "Should the proposed improvements of the bar and river channel be carried out, and result in obtaining the necessary depth of water, which seems assured from past experience, the board is of the opinion that the location on the Columbia of a drydock and naval station for making repairs to modern draft ships would be most desirable, from the undoubted advantages possessed by the river."

BORROWING FOR COUNTY.

Senator Mulkey's Bill Viewed Here With Interest.

Senate bill No. 128, introduced by Senator Mulkey, entitled an act to allow County Courts to borrow money at a lower rate of interest than the legal rate provided by law, has attracted considerable interest in Portland. The bill would permit a county to borrow money at a rate of interest not exceeding 4 per cent per annum, but the rate may be as much less as the County Court may be able to borrow the money for.

"Section 1. That the County Court of any county of this state may, when they deem it expedient for the purpose of paying any outstanding indebtedness or when the law for any year shall prove insufficient for the running expenses of the county for any year, borrow money and issue county warrants therefor, such warrants to be of such denomination as the court shall deem best; provided, however, that such warrants shall state on the face thereof the rate of interest the same shall bear, but in no case shall such rate of interest be more than 4 per cent per annum, but the rate may be as much less as the County Court may be able to borrow the money for.

"An emergency is hereby declared to exist, and this act shall be in full force and effect on and after its approval by the Governor."

WORTHY OF EMULATION.

Nebraska Editor's Opinion of New Year's Oregonian.

Chester (Neb.) Herald.

We have received at the hands of Mrs. Eva B. McKenzie, a copy of the New Year's number of the Portland Oregonian. It is a beautifully illustrated edition of 36 pages, and describes the many beautiful scenes and places which abound in that country. If we could only issue an edition of like character to this wonderful edition of the Oregonian our life would have reached its highest ambition and when we would be called hence we would lay down our work with the well-known plaudits ringing in our ears that our life has not been in vain. But our sphere of usefulness is less in more humble fields, and as we issue every week our little Chester Herald we take a certain pride that in our life we are filling a small nook that perhaps is appreciated as much as the editor of the mammoth sheet referred to above. However, The Oregonian, as well as the Herald, is accomplishing the mission unto which it has been sent, and we take up our work in the hopes that each issue will be better and better until the crowning top is reached.

Temperance Meeting Begun.

DALLAS, Or., Jan. 31.—Colonel Holt, the temperance evangelist, commenced a series of meetings here last night. About 100 signed the pledge.

IS IT IN GOOD FAITH?

QUESTION AS TO NORTHERN PACIFIC MOVE TOWARD NEHALEM.

Reasons for Doubts in the Matter—Three Lines Are Now Aiming in That Direction.

There is a disposition in some quarters to doubt the good faith of the Northern Pacific Railway Company in its move to build to the Nehalem Valley from Scappoose station. The real purpose of the projected line to Pittsburg is said to be to prevent the building of any road to that valley until an agreement shall have been reached between the four transcontinental roads operating in the Northwest for a division of the traffic or an assignment of this territory to one or another of them. Inability to agree upon this matter is said to have been the cause of keeping the Nehalem without a railroad so long. If the road shall actually be built, as announced, there is still room to doubt that Portland will profit much from it. This doubt is based upon a proposition made by the Northern Pacific to one of the men interested in organizing the new Portland, Nehalem & Tillamook Company.

It was deemed possible that the Northern Pacific track might be used to get an entrance for the Nehalem road to Portland, president Meilen said his terms for truckage into Portland would be very liberal, but he would require an obligation from the new company that all traffic originating on its line for points in the East should be delivered to the Northern Pacific for carriage. This was regarded as equivalent to sidetracking Portland, so far as Nehalem and Tillamook business should be concerned. Portland would then get nothing but the local traffic at the most. This condition was not accepted, and the arrangements for the direct line from Portland went forward. Now the Northern Pacific declares its intention to build into the coveted country.

Some years ago the Northern Pacific surveyed a line to the Nehalem Valley. Efforts were made to induce the company to build a road there, but they were without success, and all negotiations were dropped several months ago. There was then no move to build there from any other quarter, and the matter was resting quietly. Then the move to organize a Portland company to build a line direct from this city took form, and when it became evident that this line would not form a junction with the Northern Pacific before entering Portland, the Northern Pacific took action on its old survey, and announced that it would build a branch line from Scappoose to Pittsburg.

Less business is available at Pittsburg now than the place offered six months ago. Then a flour mill was in operation there, but it has been destroyed and there is no prospect of other use being made of the water-power now wasting down the rocky channel of the Nehalem at that point. The timber of that section will be available as soon as saw mills can be erected to cut it, and the Northern Pacific might find it a profitable business to haul that timber to the greedy Eastern markets.

It is said that in order to avoid a grade greater than 2 per cent a half-mile of tunnel must be bored under the summit of the divide between the Columbia and the Nehalem. This will be an expensive piece of road, and such work is necessarily slow. Engineers estimate that it would not be practicable to have trains running through the tunnel within the coming 15 months. The remainder of the construction is said to be not particularly heavy.

When the Goble, Nehalem & Pacific Railway was started for the tall timber on the Scappoose ridge, it was under-

stood to be in the interest of the Northern Pacific. Since then that enterprise is believed to have been alienated from its Northern Pacific affiliations, and President Cannon now gives it out that his line is an independent enterprise and that it is headed for the Lower Nehalem Valley and Tillamook Bay, having surveyors and right-of-way men now in the field. This road has its terminus at the Columbia River, and its traffic can reach Portland only by water or over Northern Pacific tracks.

There seems no doubt that the Nehalem country will soon be provided with one or more railroads. Some of the men acquainted with the valley say it has traffic enough for two lines—one skirting the Salmonberry River on the south, and the other clinging to the northern side of the valley, midway between the southern line and the Columbia River. Still, it is admitted that one line with proper branches could and should handle all the traffic of that country for many years to come.

MAY ENFORCE RATE RULING.
The Commission, the Santa Fe and the Denver Rate.

So far no action looking to a compliance with the ruling of the Interstate Commerce Commission, with respect to rates to Denver from the Eastern seaboard, has been taken by the Santa Fe's traffic department, says the New York Commercial. There is a strong possibility that, instead of doing so, the company will make preparations through its legal department, if it has not already done so, to contest the enforcement of any such interpretation of the law.

The commission held that, as a matter of general application, rates fixed by the railroad company at Denver, or from the East, or to and from the Pacific Coast, ought not to be higher than those between San Francisco or other Pacific Coast terminals, and the Missouri River or points East. The plan of the railroad company that the water rate between New York and San Francisco or vice versa and then inland, the commission did not consider applied with binding force, and urged that if the railroads have carried the rate which water competition fixes 1400 miles from the Atlantic seaboard, they must not stop there.

Secretary Mosely, of the Interstate Commission, has officially notified the Denver Chamber of Commerce that, as the case in some degree affects public interest, the commission will probably bring a proceeding to enforce its order, if it should be disobeyed.

PORTLAND TO THE NEHALEM.

The Railroad Route That Will Profit This City and the Country.

HILLSBORO, Or., Jan. 30.—(To the Editor.)—I have been interested in the articles written by William Reid, Joseph Gaston, Mr. Groner and others, advocating a direct line of railroad from Portland via Nehalem Valley to the coast, and as I claim considerable knowledge of the country that would be affected by such a railroad, I ask for a little space in your paper, giving my views as to the advantages of such a project, both to the promoters and to the country which the railroad may traverse.

I assert, first, that such a railroad is a necessity. Any one who is familiar with the natural resources of the Nehalem country, as I think I am, will unhesitatingly say that there is not a section of country anywhere that would prove of more value than this section. It possesses some of the most timber in the world, and the quantity seems to be unlimited. Recent developments have proved that there are vast quantities of coal in that section of the country, and it is more than probable that other minerals of more or less value are concealed in its depths.

But who is to build the railroad? Or, more plainly stated, whose duty is it to build this railroad? I answer, the interests of the City of Portland require that

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this should be done by those men who have money for investment. In order that Portland shall receive the benefit which it is justly entitled to, and especially so if it furnishes the means of conducting the railroad and developing the Nehalem country, the starting point of the railroad should be Portland.

If I am correct in this, then I want to see the road built through the country that would be the most advantageous to the promoters of the road, and likewise to the largest area of tillable lands. This result could be obtained by following what is generally conceded to be a natural railroad grade from Portland through to the Nehalem River, namely, following up the Willamette River until it strikes the mouth of the Tualatin River, and following the Tualatin River to its intersection with Dairy Creek, and following that creek to the intersection of the Upper Nehalem Valley in township 2 north, range 5 west; thence up said valley to the headwaters of Salmonberry Creek; thence down said stream to where it intersects with the Lower Nehalem River; thence down the river to the Nehalem Bay. By following this route the road would traverse a section of country that is not surpassed in the State of Oregon for agricultural purposes. The products of the fertile section of country would supply sufficient traffic and place the road upon a paying basis from the start. The route above indicated, even upon a casual glance, will satisfy any one that it is the natural route of easy grade. The railroad would be built upon low ground all the way, and nothing would have to be "hailed up" to it, but everything would necessarily gravitate to it. All the tributary streams of the Nehalem country gravitate to the main streams which I have mentioned.

I am glad to note that Portland is taking the initiative with reference to the construction of a Nehalem railroad. If Portland seeks to be benefited by it she should see to it that the road is built so that Portland will be the natural base. It is the St. Helens or Goble route should prevail. Portland would be a little benefited by it. It would follow a route that is sparsely settled and there is no fertile country through which it could possibly pass. The Willamette-Tualatin route would supply the railroad with freight and passenger traffic from the very beginning, that, in my judgment, would be profitable to the promoters of the road.

F. M. HEIDEL.

Accident to Freight Train.
DALLAS, Jan. 31.—Last evening four cars of a freight train jumped the track seven miles north of Dallas. Mrs. Tracy, a traveling woman, was slightly burned on the face by being thrown against a hot stove. No other person was hurt. Considerable delay was occasioned to the evening express, but it was enabled to leave here this morning on time.

Freight Train Wrecked.
INDEPENDENCE, Or., Jan. 31.—The Independence & Monmouth motor was delayed several hours last evening by reason of the wreck of a freight train near Smithfield, eight miles north of Dallas, whereby three box cars were badly smashed and their contents shaken up. Spreading of the rails is supposed to have caused the wreck.

Eccles to Go to New York.
SALT LAKE, Jan. 31.—S. W. Eccles, traffic manager of the Oregon Coast Railroad, this afternoon received a telegram announcing his appointment as traffic manager for the American Smelting & Refining Company, with headquarters in New York, effective February 15.

Union Pacific Dividend.
NEW YORK, Jan. 31.—The directors of the Union Pacific Railroad Company met here today and declared the regular semi-annual dividend of 2 per cent each on the common and preferred stock.

Young Armour Succeeds Father.
NEW YORK, Jan. 31.—J. Ogden Armour was elected a director of the Chicago Milwaukee & St. Paul road today succeeding his father, the late P. D. Armour.

Circuit Court Docket.
SALT LAKE, Jan. 31.—The docket of the Circuit Court of Marion County was today made up by the clerk, showing 21 cases to be disposed of at the February term.

MAP OF THE NEHALEM REGION SHOWING THE RAILROAD SITUATION.

