

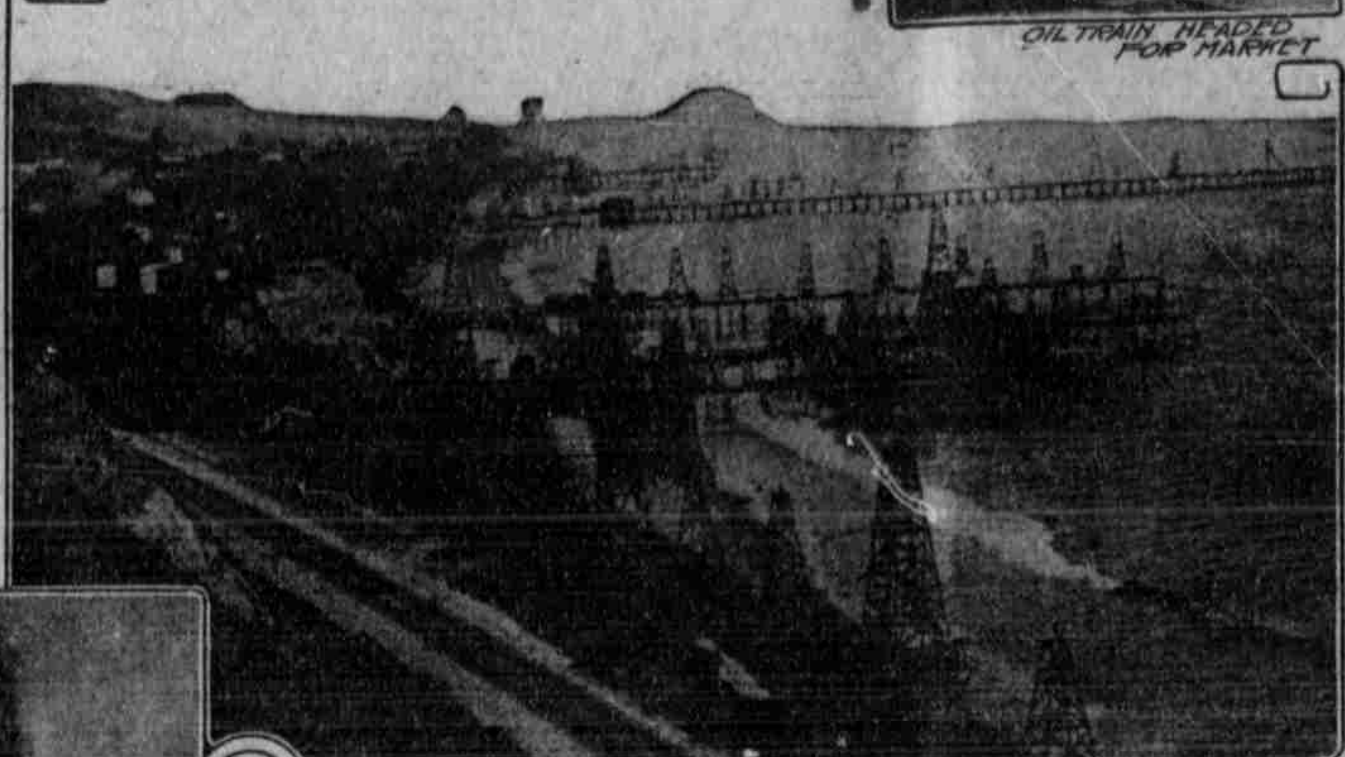
Petroleum as Old as the Hills

BY
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PETROLEUM is as old as the hills. When the earth was formed nature provided this oil, and in the crude state primitive man adapted it to many useful purposes, such as anointing, burning as fuel, and illumination, and also as an oblation in religious ceremonies; but the systematic refining of the product from its very inception is strictly an American industry.

The name petroleum, meaning "oil from the rock," was familiar to the Greeks, Romans and Persians from the dawn of their history. Herodotus wrote of the Springs of Xante, from which this oil was gathered by dipping myrtle branches on the surface of the water in 500 B. C., and it was well known at that time that asphaltum, petroleum, naphtha, and maltha were all various forms of the same substance, collectively classified as vitumen. Maltha, more commonly known as pitch, was the indestructible cement of history, used in the construction of the Temple of Nineveh and the Tower of Babel; and there is little doubt that it was universally employed for similar purposes since the day when man first con-



the Seneca Indian once dipped his blanket in most romantic fashion as he tried in vain to transfer the brilliant and variegated colors he discovered on the surface of the little pools of petroleum. Disappointed because he could not at once convert his attractive find into a satisfactory dye material, the red man found other purposes for which the oil could be employed. The blanket was carefully squeezed and the oily substance recovered. Rude pits were dug, lined with rough-hewn timbers, and the oil was stored away for future use. Thus began the first known practical conservation of petroleum in America. Many of these old Indian pits are still found in an excellent condition, the timbers being practically as sound as the day when cut from the forest.

discover the means of producing at a lower cost some other satisfactory illuminant from coal or petroleum. Researches in this line were continuous and untiring until early in 1855, when a complete and invaluable analysis of petroleum taken from an "oil spring" on Oil Creek, near Titusville, Pennsylvania, was made by the distinguished chemist, Prof. Benjamin Silliman, Jr.

The manner of driving or sinking an oil well is simpler than is generally imagined. A steel drill, weighing anywhere from 1,000 to 3,000 pounds, and measuring about 30 feet in length, is selected for the purpose. This is fastened to an adjustable line and connected with a heavy arm of beam, driven by an engine which continually raises and releases the arms and permits the drill to fall with great force into the hole. With each drop, and by its own weight, the drill literally crushes and pulverizes the rock into sand, which is removed with a "sand pump" from time to time as it accumulates in the boring. As the work progresses and the hole deepens the adjustable line is lengthened and the drill lowered as required. After drilling to depths varying from 100 to 2,000 feet, and when a crevice is struck in the rock, the oil is frequently brought to the surface by the force of its own pressure; but it often becomes necessary, in case the flow of oil is not considered sufficient, to insert a charge of explosive at the bottom of the boring, "shoot" or blast the well, and thus increase the supply. After the drilling and blasting are completed, the well is then cased with iron piping, known as a "lining," and a pump inserted.

ceived the idea of building. The malthe-lined cisterns found in Egypt and at Petrae, although of unknown antiquity, are still in a perfect state of preservation and fit for practical use. It is also a well-established fact that in the preparation of material for embalming and encaustic painting in Egypt and Mexico maltha formed the principal part.

Many theories have been advanced as to how bitumen has been produced, but no general chemical formula can be given for the occurrence of the several curious forms of the product. There is no doubt, however, that bitumen represents a substance that is obtained from petroleum, found in its liquid state in the containing rocks, and by the process of nature's laboratory has been gradually converted into its more solid form. This process may be described as evaporation. As the oil seeps to the surface, generally by its own gaseous pressure, the natural gases, spirituous and light oils are evaporated by the sun, and the residues, asphaltum and maltha, formed. Indications of the presence of petroleum are frequently found on the surface in the form of bitumen, but there is no fixed rule, and recent discoveries seem to upset the theory that oil can only be found under certain conditions. Wells have been sunk and oil found along the coast of California, where the operations have even extended for some distance into the sea. In a variety of climates and from the sea level up through the lofty ranges of the Andes has this remarkable "light of the world" been secured.

It was not long, however, before the white man began to realize the value of this remarkable discovery, and enterprising pioneers began to dig pits similar to those of the Indian and to gather the oil, which for many years was bottled and sold, under the names of "Seneca Oil," "Indian Oil," and "Snake Oil," sold extensively as a sure cure for all the aches and pains to which man is heir. It was universally accepted as a medicament, but with little curiosity as to how great a quantity of the wonderful curative could be secured or whence it came.

As early as 1790, the manufacture of salt became an important industry in the United States, and for the purpose numerous brine wells were sunk throughout the country, especially along the western slope of the Allegheny Mountains, where the brine was found in great abundance, collected, and evaporated into salt. Many of these wells had to be abandoned on account of their producing uncontrollable quantities of petroleum, then considered a most undesirable element. A notable incident of this kind occurred at Little Renox Creek, near Burkesville, Kentucky, in 1829, when an attempt made to sink a well and secure what was supposed to be an unlimited supply of brine resulted in the striking of a mammoth oil gusher. Consternation and disappointment spread among the owners of the well as they witnessed the great quantities of oil flowing rapidly beyond the creek and into the Cumberland River, where it finally caught fire and burned for a distance of over fifty miles. When the fire was extinguished the oil flowed on as rapidly as before, and, with the exception of a small quantity which was later recovered, bottled, and sold under the name of "American Medicinal Oil," the product was wasted.

In the old days each well was pumped separately, but the industry is now conducted upon such an economic and scientific basis that the wells are pumped in groups by a veritable network of connecting rods, extending over the fields and driven by an engine in a centralized station.

In some districts the oil fields have been practically honeycombed with wells and the production of petroleum greatly reduced or scattered by continual pumping.

As the enterprise grew many complex problems arose from time to time, but they have all been gradually but effectually solved and the industry placed upon a conservative and economic basis.

The total flow of oil in the United States for the year 1859, the first of which any official record has been kept, amounted to only 2,000 barrels. For the year 1909 the production as estimated by David T. Day of the United States Geological Survey amounted to about 178,000,000 barrels, which, if placed in a single body, would be sufficient to float a gigantic fleet of 935 Dreadnought battle ships of the new 26,000-ton Arkansas type of the United States Navy.

Gradually the oil derrick wended its way from a northeasterly to southwesterly direction, and the petroleum industry was extended over a vast territory.

During the year 1908 there were 16,909 wells sunk in the United States, of which but 3,214 were dry.

Extensive experiments have been conducted to determine the value of petroleum as fuel for power plants as well as for the navy and merchant marine, especially in England and the United States. Numerous merchant vessels have been fully equipped for burning oil as fuel, and, by practical test, it has been determined that oil will evaporate 30 per cent more water per pound than coal, is easier to handle and stow, offers no difficulty in burning, and, in its use, time formerly wasted in coaling and in useless labor is saved, smoke eliminated, fuel space economized, steaming and speed capacities increased, strain on boilers greatly decreased, and a clean ship assured at all times. The crude oil of paraffin base is particularly desirable for fuel, and the only obstacles to its universal use are: (1) Difficulty in obtaining; (2) increased cost over coal. With the production of sufficient petroleum at a reasonable cost, there is little doubt that every ship afloat will be eventually equipped with oil burners and the coal grates pass from use.

The United States navy has equipped the battleships Delaware, North Dakota, Utah, Florida, Arkansas and Wyoming with auxiliary provision for from 400 to 600 tons of fuel oil each.

The new battleships now under construction at the Fore River Ship Building Company, Philadelphia, for the Argentine government, will also be equipped for auxiliary oil capacities of 600 tons each.

The more volatile and inflammable portions of the raw product are separated by refining, each constituent being taken off and collected separately by gradually raising the temperature of the oil and passing the consequent vapors or gases through a series of condensers. The products from the paraffin bases are usually taken off as follows: Gasolines and naphthas, kerosene or standard white, as it is now known, other illuminating oils, light and heavy lubricating oils, paraffin, and greases of various descriptions. The percentage of each product recovered from the crude varies according to the character of the crude. A fair average of Pennsylvania crude oil runs as follows: Gasoline, 1 1/2 per cent; naphthas, 14 per cent; kerosene, 55 per cent; lubricating oils, 17 1/2 per cent; paraffin, 2 per cent; and residue of pitch, etc., 10 per cent. Many varieties of petroleum require special treatment in order to eliminate sulphur and other objectionable elements. From the asphalt-base petroleum is deprived of a residuum employed in the manufacture of insulating, water-proofing and roofing materials. A residuum known as "coke" is also used as fuel and in the manufacture of carbons for arc lights and electric batteries.

Along the banks of a stream in Pennsylvania, now known under the prosaic title of Oil Creek,

the usefulness of petroleum is almost unlimited. Besides the many grades of gasolines, naphthas, illuminating oils, lubricating oils, paraffin, and greases obtained from the crude oil paraffin base, filtered paraffin residues or concentrated jellies, are also obtained. These jellies are universally employed as therapeutic agents in diseases of the skin, as a basis in the manufacture of medicated ointments for general household use, and also in the compounding of shoe and metal polishes.

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ANOTHER GIRL

By DOROTHY DOUGLAS

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When the S. S. Marion had pulled out of sight of the crowd on the pier, Jimmy Murphy turned a wholly disinterested glance upon his fellow passengers. For the time being, his position as a newly engaged man, hung heavily on his shoulders. Helen Danvers, his fiancée, had been on the pier and as the boat pulled away leaving only the murky water between her and the man of her choice, Helen's piquant face had found a tearful nest in the bit of lacy cambric which served as a handkerchief.

been calm and chummy rather than emotional—isn't it?"

"Perhaps it has been to you—"

Molly laughed quickly. "I do believe you would be serious in another day or two. It is a good thing that we will be having that sad sweet parting so soon—"

"Stop! You know as well as I that you are only trying to cover the real by the flippant! All the time I am in London—you are going to be there. You have promised to give me one month of your splendid friendship and we are going to all the theaters, operas and dinners that we can crowd into thirty days."

Still, as the day wore on Jimmy cheered up. It seemed to him that he had never before crossed the briny deep on so wonderfully laden a ship. In companionways, in the library, in the bow of the boat and in the stern he seemed destined to meet fragments from the feminine world and each bit looked prettier than the last. For a moment Jim Murphy felt aggrieved; his allegiance to Helen Danvers shut him off from any shipboard romance—a here-to-fore much enjoyed privilege of the ocean voyage.

"No, no—that was some of our inconsequent chatter at the beginning of the trip." Molly tried to draw her arm away.

When they arrived at the stern of the boat where no sound came save the rush of foamy water, he stopped her and spoke in a voice made rich by new depths.

"You are not going back on your promise. I love you, dear—it has been so since you came and sat beside me at the table. It is not the first time that a man has found the one woman when it was too late and I am not complaining—I am only glad to have known, even for a short time, such love as I feel for you." He drew her so near him that she started back with a faint cry. He released her and before he realized her intention she was away and out of his sight.

It was at dinner that the blow came. He was in the act of giving his order to the steward when that individual rushed to the assistance of the girl who had been assigned to the seat next to his own. After one glance at her, Murphy realized that, had he been a steward, his actions would have been the same.

He stood for some moments where she had left him. He was dazed by the vastness of his love for her; too much so to reason that life with any other woman was impossible.

He did not see Molly Sherwell again that night nor the next morning. The tender was alongside the Marion and most of the passengers for Queens-town were on the smaller boat. Murphy scanned every part of the ship, but the girl was not to be seen. He concluded that she was in her stateroom packing as she was to go on to Liverpool.

"I am afraid I interrupted your order." The girl looked into Murphy's eyes. The heart of the engaged man quaked. The girl was beautiful.

"After you." Murphy's tone was reserved to the point of unfriendliness.

The girl cast a quick glance at him then turned to contemplate the menu. Murphy felt that he had been thrown from her regard much as she would discard an unpleasing bit of fabric. It was too much for Jimmie's knowledge of the joy of living. He turned to her with a smile that shone from his heart.

Nevertheless he paced the deck nervously expectant. Some inner consciousness told him that events were shaping themselves into strange channels.

When the tender with its load of Queens-town passengers was ready to detach itself from the great ship Murphy gave a tremendous start. Molly Sherwell was on the tender. She was getting off at Ireland and he, the man who loved her, had no address, no possible clue to where she would be. She had taken this means of escape!

"Please forgive my seeming rudeness," he said with a full measure of friendliness in his eyes. "I am a trifle peevish—there are the jolliest lot of pretty girls on this boat that I have ever crossed with and I feel afraid of all of them."

Molly Sherwell laughed and glanced questioning at Murphy.

"I would not have selected you as one fearful of feminine wiles."

"But I am engaged."

"Oh!"

Murphy looked down at the this stream of water which was slowly widening between the two boats. Without stopping to think of what he was doing he rushed below. In the companionway he was stopped. A cable for William James Murphy. He scarcely comprehended the contents as he continued his mad dash for the lowest possible deck of the Marion.

When he reached the closest spot to the tender and his eye caught sight of a trailing rope from her stern he made a firm clear dive into the almost calm water.

"It seemed for a second that the very engines stopped their vibrations; then the girl spoke again.

"That does make considerable difference." She paused while a queer little shadow flitted across her face. "I believe that I, too, would be afraid to cross the ocean with some jolly men on board if I owed allegiance to one in particular. Ocean liners seem to be the embodiment of the old time sorceress—I feel sure that she at least wields her wand over them all."

"The wand of infatuation—only?"

Jimmy Murphy but half expected an answer.

"Infatuation is exactly the word," laughed Molly. "I have crossed the ocean nine times and on every trip I fell madly in love."

"And the men?"

Murphy put the question quickly, eagerly desirous of knowing the outcome.

"Three of them wanted me to marry them; the others were merely the effect of moonlight, the lapping of the waves and leisure hours spent in closely set steamer chairs."

"And you?" Again the eager question.

"I? Well—as soon as my feet touch the wharf I am as heart-free as if I had never seen a boat."

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There was a fearful stirring on both boats and life preservers were hurled from all points. Murphy prayed, while he struggled with the sea, that he might reach that rope before a life saver reached him. He was a powerful swimmer. After a brief but mighty struggle his hands found and clung to the rope of the tender. For one second his eyes looked up and he saw the face of Molly Sherwell. Her eyes were praying for his safety and her arms were outstretched.

"He is mine!" he heard her say to those who would have cared for him when he went for a moment into the unconscious world.

Later, Molly bent over him. "You might have died—dear—!" Her voice broke.

"I would have died anyway—without you. Everything went with you—what was the game without love?"

The cable, soiled and quickly dis appearing to nothingness, fell between them.

"My first fiancée was very fickle. She married the other fellow five days after I left. Molly—do you know whether or not we have to live in London more than a week before we can get a license to—"

"Even a week would seem long—wouldn't it, dear?"

Jimmy Murphy was silent for so long a time that his companion broke into a soft laugh. "Surely you are not going to have many more such serious and profound moments during this trip?"

"I will tell you exactly what I was thinking—if you care to know." Murphy turned so that he met her startled glance. "Do you?"

"No," she put in quickly.

"I shall tell you, anyway. When you interrupted my thoughts I had just conquered a desire to make you care for me—your attitude made me desire a siege in which you would be the victim—but my better nature won out and—"

Murphy laughed lightly.

"Then I have missed a rather amusing game—haven't I?"

Woman Had Him Guessing.

Dan McCarthy, auditor for Coban & Harris, was fondling ten new \$100 bills in his office a day or two ago when a well known New York play broker—a woman—dropped in.

"What have you got there?" she asked of the auditor.

"It's some of our new stage money," replied McCarthy. Here he handed her a \$100 bill. "Pretty good imitation, eh?"

The woman examined the bill closely. "Is that an imitation?" she asked, in astonishment.

"It is."

"Well, I declare!" said the caller. Then she dropped the bill in her handbag and started away. "I want to show it to my husband," she said.

McCarthy, three other heads of departments and the office boy overtook her out on the sidewalk in front of the building.—New York Morning Telegraph.

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