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THE STORAGE OF PETROLEUM.

There is at present, in round numbers, 25,000,000 barrels of crude petroleum stored in iron tanks in the oil regions of Pennsylvania. It is an inland lake of oil that may be described as having reached its highest ebb, inasmuch as indications now point unmistakably to a falling off in the daily production of the wells and a consequent decline in the amount tanked. Not the least striking feature of the oil regions are the clusters of these enormous iron reservoirs, located on hill and in valley, and whose construction keeps actively employed great workshops and an army of men in Pittsburg, Titusville, Pa., Oil City, Pa., and elsewhere. The oil held by the 1,800 tanks dotting the oil regions would fill to a depth of ten feet a square reservoir or lake measuring 3,747 feet each way.

Tank building as an industry dates back to 1861, when the firm of Carroll & Snyder, of Pittsburg, were called upon to put up what was then considered a large tank, 4,500 barrels capacity. There were grave doubts whether the pressure of the liquid inside would not burst the tank, and the iron plates forming its bottom and sides were made heavier than is now considered necessary in a 35,000 barrel tank. When the tank was finally tested—with water—the spectators kept at a respectful distance until their doubts were dispelled by the water's appearance over the brim. The tank stood like a rock, and is still in existence and doing service at Natrona, 25 miles from Pittsburg. From that time the success of iron tanks in storing petroleum was assured. In capacity they were yearly increased, until to-day few if any storage tanks hold less than 25,000 barrels, while the majority of those lately contracted for hold 35,000 barrels. These monsters when set up cover as much ground as a circus tent. All are perfectly circular in form, with perpendicular sides and flat top. The largest have a diameter of 94 feet, and are 28 feet high. The iron plates in these vary from three-eighths of an inch to three-sixteenths of an inch thick, according to the locality of the plates in the make-up of the tank, those nearer the bottom, of course, having to withstand the greatest strain from the confined oil. This pressure, in a 35,000 barrel tank (filled), will equal a tensile strain of 7,000 pounds on an inch width of metal surrounding the lowest portion of such tank. The cost, at the present rates of iron, for these storehouses of nature's oil is as follows: For a 35,000 barrel capacity, 28 cents per barrel, or \$9,800; a 30,000 barrel capacity, 27 cents, or \$9,450; and a 25,000 barrel capacity, 30 cents, or \$7,500. The largest sized tank when ready for oil will weigh 93 tons. In their construction very little skilled labor is required, except when "setting up." Improved automatic machinery cuts, bends, and punches the plates with extreme rapidity and accuracy, so that on being set up every one of the 200 plates with their rivet holes is found in its appointed place. The three lowest "rings" of plates, it might be added, are double riveted. Before the use of plate iron in tank building, wood or wood and iron were used, and to prevent such tanks from leaking was almost impossible, this difficulty increasing with their capacity.

Of the 25,000,000 barrels of petroleum now stored in tanks fully one-half is owned by the United Pipe Lines (Standard Oil Company), the balance being owned by other pipe lines and by private parties. A single banking firm of New York owns a half million barrels stored in Pittsburg built tanks and awaiting better prices. The growth of this enormous stock of oil has been as follows, according to the most reliable statistics—the barrels are of 42 gallons each: August 31, 1878, 4,599,362 barrels; 1879, 7,620,525; 1880, 15,063,651; July 31, 1881, 24,888,337; August 31 (estimated), 25,000,000.

Until very recently only crude petroleum was tanked, but at present a Pittsburg builder is at work on iron tanks for the Standard Company for the storage of refined oil at Louisville, Cleveland, Chicago, Indianapolis, St. Louis, etc. To retain this searching fluid requires an extremely tight and well built tank.

PRESIDENT GARFIELD'S FATAL WOUND.

President Garfield was shot on the morning of July 2, while passing through the Baltimore and Potomac Railway Station in Washington. The assassin—previously known as a petty swindler and disappointed office seeker—fired two shots from a heavy pistol, one ball taking effect.

The wound was expected to be immediately fatal, and during the first day the physicians sought only to diminish the more alarming symptoms by administering stimulants and hypodermic injections of morphia and atropia. In the evening the patient rallied a little and a superficial examination was made. The bullet entered the body about two inches to the right of the fourth lumbar vertebra, between the tenth and eleventh ribs. It was mistakenly assumed that it passed through the liver and lodged somewhere in the front wall of the peritoneal cavity. From the supposed nature of the wound the attending physicians thought that death would ensue before midnight. The President did not die, and the expected symptoms of peritonitis and those which should have followed a serious lesion of the liver, kidney, or intestines did not appear.

On the 4th of July, Dr. Agnew, of Philadelphia, and Dr. Hamilton, of New York, were called in consultation. No thorough surgical exploration of the wound appears to have been made, or indeed was possible or justifiable at that time, and the treatment proceeded on the, as it proved, entirely mistaken diagnosis first made.

By the latter part of the month symptoms indicating pus

poisoning were apparent. On the morning of the 24th, Dr. Agnew opened a pus cavity, which had formed a few inches below where the ball entered, and removed a splinter of bone. It was now evident that the ball had struck a rib—the eleventh, breaking it in two places; and it was inferred that it had been deflected downward. Its actual course, however, remained undetermined. Relieved by the better drainage of the wound the President seemed to improve slightly. Another operation was performed by Dr. Agnew, August 8, but its nature and purpose have not been made public. During the ensuing week the decline was steady, if not rapid, and then a more hopeful period set in. This was broken by the appearance of an abscess in the right parotid gland, August 18, followed by trouble in the lungs and a distressing cough. Since the operation of the 8th the patient's stomach had been greatly disturbed and intolerant of food.

The patient's desire to get away from Washington had been persistent, and by the first week in September it was apparent that it was useless to wait for improvement before making the attempt to remove him. Foreseeing speedy death if he remained, it was decided as a last resort to attempt the journey to Elberon, near Long Branch, by the sea. The removal was accomplished September 6, but was unavailing. The sight of the ocean helped to soothe the remaining days of the President's life, but the inevitable end came on the night of Monday, September 19.

The *post-mortem* examination revealed the not unexpected fact that the wound was in all probability fatal at the outset, and the surprising fact that throughout the physicians had been entirely at fault touching the course and position of the deadly bullet. The official report of the autopsy, dated 11 P.M., September 20, runs as follows:

"By previous arrangement a *post-mortem* examination of the body of President Garfield was made this afternoon in the presence and with the assistance of Drs. Hamilton, Agnew, Bliss, Barnes, Woodward, Reyburn, Andrew H. Smith of Elberon, and Acting Assistant Surgeon D. S. Lamb, of the Army Medical Museum, Washington. The operation was performed by Dr. Lamb. It was found that the ball, after fracturing the right eleventh rib, had passed through the spinal column in front of the spinal canal, fracturing the body of the first lumbar vertebra, driving a number of small fragments of bone into the adjacent soft parts, and lodging below the pancreas, about two inches and a half to the left of the spine, and behind the peritoneum, where it had become completely encysted. The immediate cause of death was secondary hemorrhage from one of the mesenteric arteries adjoining the track of the ball, the blood rupturing the peritoneum, and nearly a pint escaping into the abdominal cavity. This hemorrhage is believed to have been the cause of the severe pain in the lower part of the chest complained of just before death.

"An abscess cavity, six inches by four in diameter, was found in the vicinity of the gall bladder between the liver and the transverse colon, which were strongly adherent. It did not involve the substance of the liver, and no communication was found between it and the wound. A long supplementary channel extended from the external wound between the loin muscles and the right kidney almost to the right groin. This channel, now known to be due to the burrowing of the pus from the wound, was supposed during life to have been the track of the ball.

On examination of the organs of the chest evidences of severe bronchitis were found on both sides, with bronchopneumonia of the lower portions of the right lung, and, though to a much less extent, of the left. The lungs contained no abscesses, and the heart no clots. The liver was enlarged and fatty, but free from abscesses. Nor were any found in any other organ except the left kidney, which contained near its surface a small abscess about one-third of an inch in diameter.

"In reviewing the history of the case in connection with the autopsy, it is quite evident that the different suppurating surfaces, and especially the fractured, spongy tissue of the vertebra, furnish a sufficient explanation of the septic condition which existed.

(Signed)

D. W. BLISS.
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HEAT, SUN STORMS, AND YELLOW LIGHT.

The first week in September was characterized by a number of days of extremely hot weather, the temperature in this city rising above 100° Fah. During the days of greatest heat the sun appeared to be greatly disturbed by storms. Whether the terrestrial high temperature was due to the direct action of solar disturbances, or to the forest fires then raging in Michigan, or to the indirect effect upon our atmosphere of the volumes of smoke which darkened the sky over many thousands of square miles, it is impossible to decide. The phenomena apparently connected with the smoky condition of the air were sufficiently marked to make the week a memorable one. On the 5th and 6th a peculiar yellow haze overspread the land from Canada to the Atlantic coast, deepening in many places to brown and black, so that lamps had to be lighted at mid-day. In this city the yellow haze was noticeable, but not so dense as elsewhere. At Saratoga the ghastly yellow appearance of the atmosphere increased to the positive shade of an orange lily, and it was next to impossible to recognize a person at no greater dis-