

be the more preferable for water removal, although the horizontal still seems to be used almost universally throughout the United States for tar distillation. Even from the point of construction and maintenance the vertical one is most favorable in that it would not require a separately built smokestack and when burned out at the bottom could be replaced easily. It should induce better evaporation in that there would be a more direct and quicker circulation of the gases. While the heating surface appears less this may be increased by the use of vertical fire flues, which would also serve as smokestacks. There would also be less tendency to foam, which means that the operation could be rushed more with less danger of the oil boiling out of the still.

The open-tank method described above should evaporate at least 1 per cent. of water per day while the liquid is kept heated above 180° F., not to mention the free water which would separate and rise to the top. The still method would probably evaporate about 1 per cent. of water per hour. The still would require extra fuel and attention, whereas the open-tank coils would tax the main boiler and its fireman very little more.

Of course, there are numerous other methods of water extraction, such as the centrifugal and vacuum processes, some of which might be preferred in individual cases.

THE WORKING OF GYPSUM.

Mr. L. C. Snider has published some good information in Bulletin 11 of the Oklahoma Geological Survey, concerning the calcining of gypsum.

Its principal commercial value arises from the fact that at the moderate temperature of 130° C., three-fourths of its water of crystallization is expelled, yielding plaster of paris. Water begins to come off below 100° C., but very slowly up to 130°. At 163° C. more water is expelled, and if a temperature of 221° is not exceeded, the resulting plaster is still serviceable, but if calcined above that temperature, the plaster becomes increasingly slow to set with the addition of water. At 343° C. gypsum is completely dehydrated, and the "dead burned" plaster loses all hydraulic properties, becoming CaSO_4 , or anhydrite.

In practice, two dissimilar methods are employed for calcining gypsum. The older method uses kettles holding up to 25 tons. The gypsum is first pulverized by passing successively through jaw crushers, gyratory crushers, and buhr mills, and is then charged slowly into the kettles, which are heated from outside and are provided with interior stirring devices. In about 1 hr. after filling, the mass reaches a temperature of 230° F. and begins to "boil" by rapid expulsion of water. When it reaches 350° F., the plaster is discharged into a cooling pit, and is afterwards screened, the coarser grains being reground.

The more modern Cummert continuous process utilizes a rotary kiln through which furnace gases and hot air are drawn by fan. In this method, the gypsum is crushed only to nut size before being fed automatically and continuously into the kiln. It passes through the kiln in about 10 min. and is discharged at a temperature of nearly 500° F., which, however, is not sufficient to "dead burn" the gypsum, owing to the presence of moisture which is not fully expelled during the short stay in the kiln. The hot gypsum is then stored in brick bins, where the mass acquires a uniform temperature just sufficient to produce plaster paris of the right quality. The calcined lumps are then pulverized and sifted. The advantages of the latter method are (1) that less than half so much fuel is required per ton of output, owing to the continuity of the heating, and (2) less power is required to pulverize calcined than raw gypsum.

COAST TO COAST.

St. Mary's Ont.—A new C.P.R. station at St. Mary's has been opened recently for public use.

St. Thomas, Ont.—Water has been pumped into the new water tower at St. Thomas, and no fault has been found in the construction.

Edmonton, Alta.—Estimates amounting to \$1,325,161 as expenditure for maintenance and operation of the city utilities department are being considered by the Edmonton City Council.

Port Nelson, Ont.—The last mail received from Port Nelson, which arrived at Ottawa, contained the information that the tower of the wireless station being constructed there to connect with Le Pas, had attained the height of 150 feet on December 15th. It is estimated that, by this time, it is complete.

Guelph, Ont.—The annual report of the road superintendent submitted last week at the county council showed the amount expended under the Highway Improvement Act last year to be \$61,283.95. Of this sum, \$25,968.97 was expended upon bridges, and \$35,314.98, upon culverts and general road construction.

Ottawa, Ont.—The annual report of the N.T.R. Commission for the financial year ending March 31, 1913, showed the total expenditure for construction as \$13,729,461; or, the total expenditure from March, 1904, to March, 1913, as \$130,247,152. The total grading done by March, 1913, was 1,739 miles. The total miles of track laid was 1,720 miles on the main line and 384 miles on sidings and double track, making a maximum total of 2,125 miles.

Winnipeg, Man.—The surplus on the operation of Government telephones for the year ending November 20, is shown by the report of the Hon. Hugh Armstrong, provincial treasurer, to be \$30,264.64. The total revenue for the year is quoted as \$1,707,149.74; net earnings, \$437,239.84; and interest charges, \$406,975.20. The report also details large expenditure on new construction during the year, as well as a general increase in the salaries of employees throughout the system.

Verdun, Que.—Some months ago, Verdun embarked upon a project to prevent just such an emergency as occurred recently in Montreal—i.e., it reorganized its water service, the result being that within a few weeks, it will have in operation a new pumping plant capable of supplying to the town 4,000,000 gallons daily, this in addition to two reserve pumps, which at present supply 3,000,000 gallons daily, making a total of 7,000,000 gallons; while the total consumption of the town at present is only 1,000,000. The new pump is supplied by a separate intake, the two already in existence supplying the two reserve pumps, and will provide, when it is completed, three distinct and complete sources of water supply. In addition, the water will be filtered.

Fort William, Ont.—A busy season in ship repair and construction is reported at the harbor of Fort William, and also at the Port Arthur drydocks. At Fort William, the tugs "Sarnia" and "Home Rule," owned by the Thunder Bay Contracting Company, are undergoing extensive alterations and repairs; and the eight dredges which have been working in the harbor during the past season for navigation, are being overhauled in preparation for next season's work. At Port Arthur, the work on the large steel freighter under construction is progressing favorably and it is expected that the vessel will be launched about the end of March. Also new motors have been installed in the C.P.R. steamers "Alberta" and "Athabasca"; new pistons are being installed in the engines; the wiring system of the boats is being entirely renewed; new anchors have replaced the old-fashioned ones; and alter-