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NOTICE.

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A MONSTER TUNNEL.

Few people, even those living in cities, have any idea of the net-work of canals, large and small, which are necessary to carry away the refuse or sewage from these cities. The following is a description of one of the principal ones in Montreal:—

In order to render the eastern portion of the city of Montreal more healthy by furnishing a more perfect system of drainage, as well as to give an outlet at the foot of St. Mary's current for the sewage from the western part of the city, what is now known as the Craig street tunnel was projected. The first steps were taken to carry out the project in December, 1875, when, in order to give work to the unemployed laborers of the city, it was resolved by the City Council to commence its construction. Mr. James Low was put in charge of a large number of men, who began the excavation for the tunnel at the east end of Craig street. The excavation there had to be made nearly forty feet deep and fifteen feet wide. The sides of the cutting had to be lined with planks kept in place by cross stays of timber. In other places where quicksand was met with, in order to build the siding, one end of the plank was formed like a wedge, while an iron band was fastened around the other end to prevent it from splitting while being driven like a pile some distance below the excavation as it proceeded. In some places the lateral pressure from the quicksand was so great that a second row of planks had to be driven down, covering the seams of the first row, and jackscrew cross-stays put in by them, the sides of the cutting being powerfully pressed outwards. Nearly all of the side sheetings, and all of the cross-stays except the upper row, as well as the jackscrew-stays at the bottom, were left in their position when the excavation was filled in after the brick-work was completed. At the close of the first year, the brick-work—which owing to several delays had not been commenced until April—was completed for a distance of 2,293 feet. The greater portion of the earth from the excavation was drawn up by horse power. A steam engine was procured to take the place of horses, but as the vibration of the engine caused the quicksand underneath to press more strongly into the cutting, it was not much used during the first year.

To obviate this difficulty as well as to prevent delays in the moving of the derricks, Mr. Low invented the railroad scheme. Large cross pieces of timber were placed across the cutting; these were placed lengthwise with the cutting over the edges of the excavation—like rails on a railway—two pieces of timber about eight inches square. The engine for

hauling up the earth was placed on a platform built on low wooden wheels, while huge cranes were erected on platforms in front and rear of the engine. At the extremity of the arm of each crane was a pulley, over one of which a steel rope was passed, while over the other was passed a chain. Both the steel rope and the chain were attached to the drum of the engine, which when set in motion soon brought large tubs filled with earth to the surface

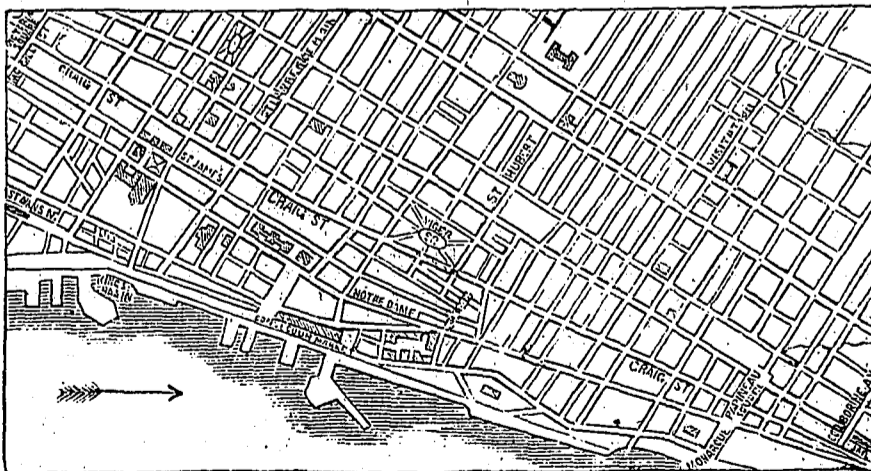
ter, in order to keep out the snow, the excavation was covered over with planks.

The interior diameter of the tunnel is about eight feet. Great difficulties were encountered in placing the "cradle," which had to be placed at the bottom of the cutting before the brick-work could be built; in some places the quicksand prevented the cradle being placed at a sufficient depth; in other places where soft mud was encountered, the cradle after being

each yard of the completed work, and a packing of old bricks to the full breadth of the excavation was laid outside the shoulder of the tunnel. The bottom of the tunnel being lower than the surface of the river in winter time, a dam was erected across the tunnel near to the Champ de Mars. The whole length of the tunnel when completed will be 8,650 feet; it has a descending grade of four and a half feet to the mile. At McGill street the depth of the tunnel is 16½ feet, while at its junction with the Colborne Avenue tunnel it is nearly 40 feet deep.



THE CRAIG STREET TUNNEL WORKS—OUT-SIDE VIEW.



PLAN SHOWING A SECTION OF MONTREAL WITH THE COURSE OF CRAIG STREET.

of the excavation. The contents of these tubs were emptied into carts waiting beside the platform. As soon as these carts were filled they were driven around and the contents turned into the part of the excavation where the brick-work was completed, thus saving much extra handling of the earth. The platforms were covered in, so as to protect the workmen in inclement weather. In win-

placed in position had to be surrounded by sheet piling, and about ten thousand bricks were piled upon it and left some twenty-four hours in order to settle, after which an extra thickness was put on the bottom of the cradle to bring it up to the proper grade.

The walls of the tunnel are built twelve inches thick, with hard-burned bricks laid in cement. About 1,800 bricks were built into

TOBACCO-SMOKE IN THE HOUSE.

I am angry—yes, I am boiling over. "At whom?" Nobody: I am angry at what—a big what—tobacco-smoke in the house. I occupy the third story of a nice house, and the rooms are pleasant; but the husbands in the two families below smoke in the house, and the smoke will come out of their rooms, up the hall-way into mine, and I cannot help it. My door may be closed, and theirs closed, and yet enough of their smoke will come into my rooms to nauseate me. I pity their wives and little ones who have to stay right in it and breathe it to the full. Does not the Bible and Nature and the United States Constitution give us a right—an inalienable right—to pure air, and has anybody a right to deprive anybody else of it? No; and anybody who does is by so much a hater and robber of his race. Yet the smokers do not mean to be—they do not realize. Oh the tyranny of the tobacco habit! I know a man near—head of a large family—who told me that they do not have butter on their table except on Sundays, and that man keeps on using tobacco, and owing house-rent and leading a class-meeting and a prayer-meeting—that is, he cares more for tobacco than he does for butter for self and family, than he does for paying an honest debt, than he does for subscribing to support his church, than he does for consistency in setting a thoroughly good example. I know another man near, who told me that it cost him thirty cents a week for tobacco, and yet when I asked him, a church-member, why his little daughter did not come to church, he replied, "The old story in these times, the lack of means;" and his wife told me that their table had not known butter for months. That is, he cares more for tobacco than he does for comfort of family, soul of daughter and Christian usefulness. I know another man near, who told me that tobacco cost him thirty cents a week, and yet who said that he, a church-member, could not come to church for lack of pants good enough, and three months after, he had the same reason, though meanwhile he had smoked up \$3.00, enough to have bought a decent pair of pants. That is, this man cares more for tobacco than for decency and religion. And so with thousands who profess to be followers of the Lord Jesus Christ. Would Jesus do these things? But "the dawning light is breaking." Many Christians have got their eyes open, the churches are moving, and the good time is coming when a man may live on the third floor and not feel that he is half-smoked out by men living below.—*Cor. N. Y. Witness.*

"TELL THE MEMBERS OF THE LEAGUE THAT WHEN they come near their last hour they will bless God that they have never darkened their reason nor destroyed their self-control by drinking—that they have not set an evil example to others, but that they have set an example of self-denial."—*Cardinal Manning, Letter, read at meeting in London, December 31.*

S. GEORGE  
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