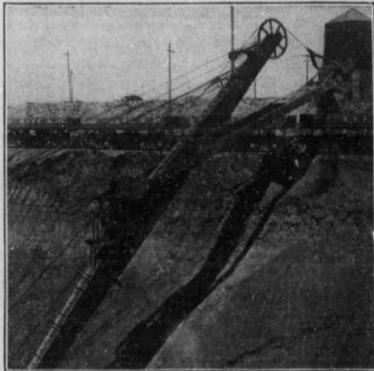


The order in which the work was opened up was dictated both by the length of time required for the excavation and by the location of three existing railroad crossings. Two of these are close together, as may be seen from the map, a short distance south of the Whirlpool Gulch, a deep cut which it is believed was once the bed of the Niagara River. Just south of this gulch occurs the heaviest earth cut on the canal,

entirely in rock, and there is a large forebay approximately 300 by 1000 ft. to be excavated. This rock will be removed by the railroad shovels, of which there are two of 3½-yd. and one of 2½-yd. capacity. There are also two ½-yd. caterpillar revolving shovels on the work.

The forebay excavation was begun when the two large shovels were started, in order to provide rock for



ONE OF THE SHOVELS WAS RIGGED TO LOAD CARS ON TRACKS 64 FEET ABOVE GRADE

a face of 100 ft. being encountered here for a short distance. The shovel that started in at the south face of this gulch is the one with the 5-yd. dipper rigged to load cars on tracks 64 ft. above grade. It was possible to dispose of the excavation from this shovel to the extent of 1,500,000 yd. in the Whirlpool Gulch itself, making it unnecessary to cross a main-line railroad in order to get to the central dump. Since the short section between the Grand Trunk Ry. crossing and the next crossing south was the location for the Y leading off to the main dump, and since it could therefore be excavated before the railroad crossings were constructed, this point was selected for starting the other large shovel. With the excavation begun in this way, both shovels could be kept busy while the first bridge was being built. The construction railroad will pass under these railroad bridges, and sufficient clearance is provided for the large shovels by taking down the booms. The southerly shovel will be let out in this way and will proceed south, following the construction railroad and the pilot cut for the loading tracks, until the overburden is completely stripped; being helped, in all probability, by the third shovel when it arrives. The loading tracks will then be lowered to the rock surface, a pilot cut will be made by the railroad shovels, as in the earth section, and the shovel now operating at the Whirlpool Gulch will follow through, taking out the rock cut to grade. The other shovels will, on the completion of the earth excavation, turn north to meet it.

North of the Whirlpool Gulch the cut is almost

track ballast and for concreting. As the heavy end of the rock excavation is near the forebay, and as little stripping had to be done, the main crusher plant was located here. The rock, which is Niagara limestone, will be used as aggregate for all the concrete. A concrete plant located at the lip of the gorge above the power house will be able to concrete the head house and power house by gravity. As these structures will not take more than 18 months to build, it has not been necessary to start them as yet, and no work beyond the clearing of the building site has been undertaken at this point.

The remaining portion of the work, the dredging of the Welland River, is being carried on simultaneously by a 3-yd. dipper dredge and a large cableway operating a clamshell bucket. On account of bridges, houses and rough ground the cableway was not able to start within 4400 ft. of the intake, and the work between that point and the Niagara River will be done by the dredge, the material being scowed into the Niagara River. The cableway has an 80-ft. head tower and a 60-ft. tail tower, both traveling on railroad trucks on parallel double tracks. The span is 800 ft., and the rig handles a 3-yd. clam. The head tower on the north bank of the river is set far enough back so that all the excavated material can be disposed of by dumping it on that bank. The total cut in the Welland River is to a depth of 30 ft. below the surface, but at 24 ft. below the surface a limited deposit of quicksand has been struck, which cannot be dug with any type of grab bucket yet tried on the cableway. It will prob-