

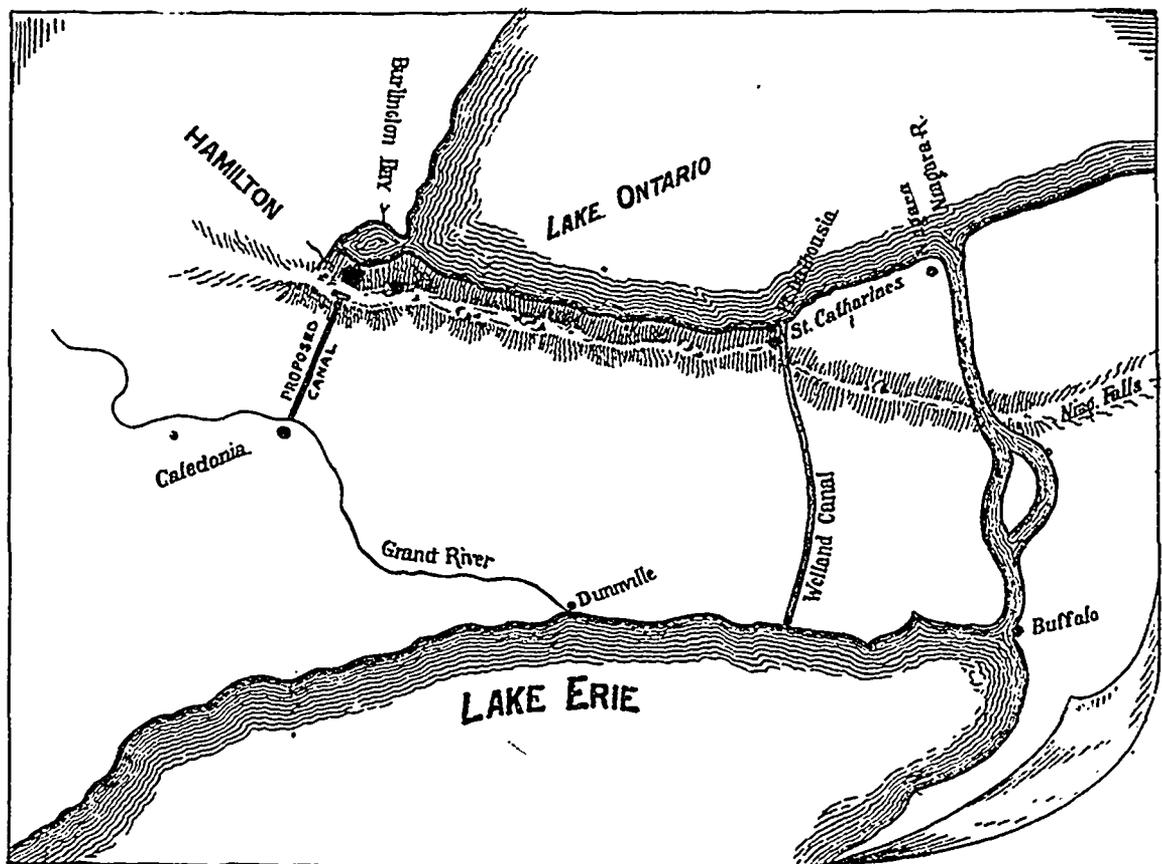
ilton, which appears in your December number. I have estimated the highest lands between Lake Erie and Ontario, on the route of the proposed canal, to be 50 feet; Mr. Killey states that the survey fixed the height at 53 feet. By using the bed of Grand River for part of the canal as proposed, there will be no danger of the wind blowing the water over the banks as anticipated by Mr. Killey.

In regard to the velocity of water through open canals, I cite the case of the Mississippi River, which has a fall from Cairo to the Gulf of Mexico of 330 feet, the distance being 1,100 miles by river, or $3\frac{1}{4}$ inches per mile of incline; and from New Orleans to the Gulf the velocity is fully three miles per hour, with a fall of less than one inch per mile on the surface of the river.

The bed of Grand River at its entrance to Lake Erie is twenty feet below the surface of the lake. Now, if the bed be dredged to true level back to Caledonia (disregarding the inflow from above), the depth of water at Caledonia will be twenty feet, and the surface will be

feet; length, 36 miles. By utilizing the bed of Grand River, as suggested, the cost need not exceed \$3,000,000 all told.

Mr. Killey is away off in regard to the flow of water through open canals. There is no necessity for inclining the bed of a canal, as the surface will form its own incline for every condition. I can fully sustain every proposition made in this matter, and will be pleased to do so when occasion offers. I have all the data and all the books, and while I have not been over the ground for many years, and have neither map nor profile, I begin to think that I know as much about the matter as those who have had every advantage. Local engineers need not be offended that suggestions come from abroad, as it is often the case; the great improvements made at the mouth of the Mississippi River were suggested and carried out successfully by persons living 2,000 miles away, and, as in the present case, were bitterly opposed by local engineers. The same is true of other great improvements, to wit, the Suez Canal, the draining of



on a true level with Lake Erie; if an open canal be cut from Caledonia to Hamilton on the same true level, the surface of the water on this canal on the top of the mountain will be on the same level with Lake Erie and twenty feet deep, and the surface will be 330 feet above Lake Ontario.

The foregoing supposes that no water is being taken from the canal; as soon as the water is taken out for power, or other purposes, the surface will fall until an incline is formed sufficient to induce the flow, and this incline will not exceed two inches to the mile for a velocity of three feet per second for continual flow—a velocity that will not be too great for navigation. If the bed of the channel be depressed two inches to the mile, the surface will remain practically level for the same velocity—three feet per second.

The cost of the Welland Canal is set down officially by Mr. McAlpine to the New York Legislature in 1853, at \$7,000,000; width of the canal, 71 feet; depth, 10

the Zuyder-Zee, and the Panama Canal, which will surely be completed. History is often repeated.

When I mentioned Hamilton as a proper place for a central power station, I meant Hamilton or vicinity. The station may be located at or near the city, as may be found best. The tail race will run parallel with the base of the mountain or the distance required for the turbines, and then take any route found most suitable. The bed of the tail-race will be at least ten feet below the surface of Lake Ontario. Since the greatest cost of the works will be the bringing of the water from Lake Erie to the top of the mountain, it would be but proper to set the turbines as low as possible in order to obtain the full benefit of the fall, which will not be less than 300 feet.

Now, as before said, my proposition is a canal running through the bed of Grand River, having a depth at Lake Erie of fifteen feet below the normal lake level, and having an incline of two inches to the