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NOTE ON NIAGARA FALLS.

The following diagrams are from the map issued by the New York Commission, which is based on surveys made in 1883 by Thomas Evershed, under the direction of the State Engineer. The Institute is indebted to the proprietors of *Nature* for their kind permission to insert the diagrams and accompanying remarks.

The diagrams give the outline of the Falls as determined on three surveys, namely ; The New York Geological Survey of 1842 ; The United States Lake Survey of 1875 : and The Survey of 1883.

Mr. E. Wesson, of Providence, R.I., remarks on these diagrams as follows :—

" I divide the contour from β to Goat Island into thirty-three sections, disregarding for obvious reasons the overflow north of β, on the Canadian

Fig.1.
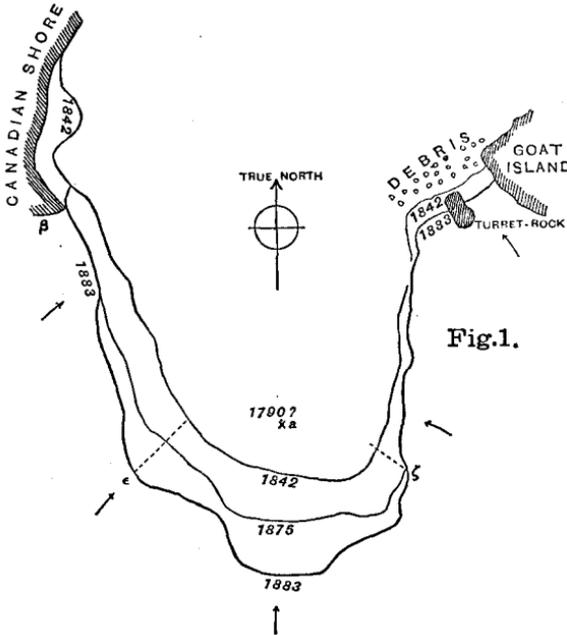
shore. From β to ε are eleven sections, from ε to ζ are twelve sections, from ζ to Goat Island are ten sections. It is obvious that much the greater work has been done between β and ζ, and that the innermost recess has kept in the same relative position.

" The means of the measurements on the sections, along perpendiculars from the contour at the date of each survey, measured on a tracing of the published map, give the following results for the Canadian Fall (Fig. 1):—

	33 years ending in 1875. ft.	8 years ending in 1883. ft.	41 years ending in 1883. ft.
Mean aggregate recession along contour of 2,000 feet, from β to Goat Island ...	80 ...	— ...	114
Mean aggregate recession along contour of 1,200 feet, β to $\zeta =$	— —	60 ...	—
Mean annual rate of regression along the whole contour where a visible change was effected = ...	$2\frac{1}{2}$ ...	$7\frac{1}{2}$ ...	$3\frac{3}{4}$
Total maximum regression at the innermost recess = ...	118 ...	135 ...	253
Annual rate of maximum regression = ...	$3\frac{2}{3}$ ...	$16\frac{1}{2}$ ...	$6\frac{1}{6}$

" The ' American' Fall, measured in ten sections, gave a total mean recession of $37\frac{1}{2}$ feet in the 41 years ending in 1883, which is at the rate of about 10 inches per annum.

" I do not know that I have seen any estimate attempted of the relative volumes of water passing over the two Falls. From such imperfect data as I have, referring to depth and swiftness, I should think that the rate of erosion for each Fall gave some approximation to the volume of water

Fig. 2.
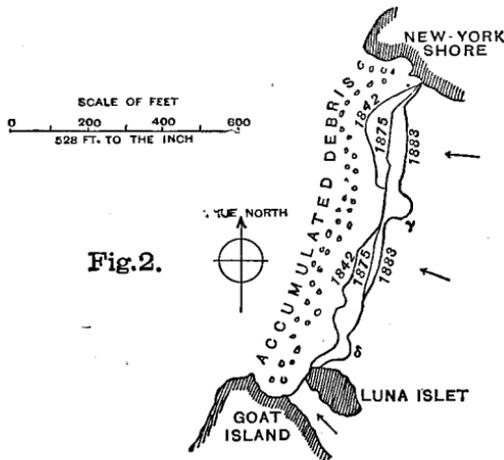
discharged over each ; that is to say, $2\frac{3}{4}$ feet per annum for the Canadian Fall, $\frac{5}{6}$ foot per annum for the ' American' Fall, would signify that the former pours over its brink three times as much water as the latter.

" At the rates of recession above shown it is evident that at no very remote age the two Falls were united in one when abreast of the point in Fig. 2 marked ' New York Shore,' and the entire width was about the same as that of the present Canadian Fall alone. Moreover, the mean width of the

Fall, from the time it commenced its work at the 'heights,' seven miles below its present position, according to Lyell's statement as to the gorge of Niagara River, was not greater than the present Canadian Fall. Adding together the present work done by both Falls, we should have about $3\frac{1}{2}$ feet per annum as the backward work performed when the entire volume poured over a single Fall of the width of the present Canadian Fall.

" At this rate 10,000 years would seem sufficient time for the cutting out of the present gorge terminating at the 'heights' towards Lake Ontario," instead of 35,000 years, the hitherto accepted estimate of Lyell, which was arrived at in the absence of the more perfect data which modern research has placed within our reach.