

movement of the sheet struck the ice pushed over the ice a house of cards occurred by the re-

the grand order are the final setting immediately preceded river. Sometimes onally but a few een them; and it criterion by which ware when the ice for the season, and me safe for them across its rough This is never the opening of consid- some part of St. embarrassed many on why this rule, e of the peasantry, ut the explanation opening is merely b-glacial passage he water, through eroion and tem- hich, where the been sufficient to . The formation ession of a sup- and a consequent rise of the river any further move- a true mark ole winter, never e temperature of ro of Fahrenheit; ce the waters of ubside, escaping hich it is the index. however fall so ner level; but the great to demon- s extent to which and to show that s it has reached iver. For it will y one, that when m its height will subsidence of the proceeds, the ice, which it has in present various d a resting-place is left supported ent to permit its bsidence has at- rough of the St. ts a glacial land- and valleys that and while some of d upon a base of undred or two in height of ten to

fifteen feet above the level of those parts still supported on the water.

On the banks of the St. Lawrence, in the neighbourhood of Montreal, there is an immense collection of boulders, chiefly from rocks of igneous origin, and among them syenite greatly abounds. They are of all sizes, but many are very large, and multitudes must be tons in weight. From their appearance above the surface in shallow parts of the river it is very probable the bed of it teems with them also; and it is remarked by the inhabitants that the positions of these boulders, both in the river and on the banks, frequently appear changed after the removal of the ice in the spring. I spent several days in the autumn of last year examining the boulders along shore, all the way from Montreal to Lachine, a distance of nine miles; and on again looking at them in the spring I missed some which had particularly attracted my attention, but as I had not mapped their positions I may inadvertently have passed them over. But when we consider the manner in which the ice packs and subsequently moves, it cannot fail to appear a very probable agent in transporting these blocks. Closely jammed together down to the very bottom of the river over such extensive areas as have been mentioned, and there solidified by severe frosts around the projecting materials that present themselves to its grasp, the ice must seize a multitude of the loose boulders below; and not only will these be carried away, occasionally to very considerable distances, when it breaks up in the spring, but firmly set in their glacial matrix, they will, when, in the course of the movements that occur, such masses as hold them are forced over shallow places, act as graters to register in parallel grooves on the face of such rocks as they encounter a moment of their progress as they pass along.

The boulders in the middle of the river may at once be occasionally carried to considerable distances; but it can scarcely be so with such as are stationed at or near the borders. For though these may become packed and imbedded in marginal ice, and by the force of a general movement or *shove*, as it is termed by the inhabitants, be driven obliquely up the bank, as soon as this ceases they will there be left; and as these general movements occur only three or four times during a season, and are never of long continuance, and even where the marginal ice is driven up the bank the friction it suffers soon causes succeeding portions to pile over one another, it is evident the boulders would not be carried by it to any very great distance. When a break-up occurs in the spring, it is the great body of ice in the middle of the river that is carried away, which, separating from the grounded portion on the margin, leaves this to be melted down by

the increasing temperature of the season. The movements of succeeding winters may push marginal boulders farther and farther on, but they must at the same time have a tendency to carry all within a certain range gradually nearer to the bank, and at last place them in a position at the very limit of their influence. And it is certainly the case, that in the neighbourhood of Montreal there are in many places along the borders of the river collections of boulders sufficiently great to induce the supposition that their presence may be accounted for in this manner.

It is not however only on the immediate banks of the St. Lawrence that boulders abound. They are more or less spread over the whole island of Montreal, and over the plains on the opposite side of the river. I do not pretend to have ascertained their distribution with the precision necessary to permit the expression of an opinion as to the causes which placed them, but I may state that they appeared to me more abundant in the upper part of the island than in the lower, and that proceeding down the valley of the St. Lawrence they ceased altogether not many miles below the island in question: and it may be further remarked that they did not seem of less weight at the limit of their range than elsewhere.

M. LE CAPITAINE CHARLES LEGER, DE LACHINE,

exprima ses vœux pour la mitigation des inondations, comme suit :

Pour bien comprendre ce que je vas vous dire il faut que vous m'écoutez bien. J'ai navigué sur le St. Laurent et l'Ottawa pendant une trentaine d'années, et je connais parfaitement bien ces rivières-là. Quand le vent est sud, la glace se brise à peu près trois milles en haut de l'Île Dorval jusqu'au bas de Lachine. Quand le vent est nord ou nord-est la glace se brise toute dans la grande anse de la Pointe-Claire.

Les 3, 4, 5 et 6 janvier 1886, la glace s'est brisée en bas de l'Île Dorval, le vent est reviré nord-est le 8 janvier au soir, un gros vent bien fort et puis bien froid; le 9 une grosse tempête de neige et puis le vent pareil, et la glace s'est brisée jusqu'à la grande anse de la Pointe-Claire et elle a descendue le 10 et le 11, ce qui a causé l'inondation à Montréal.

Les 15, et 16 et 17 janvier 1886, la glace a passée à Lachine venant de la Pointe Claire, ce qui a fait monter ici l'eau de 15 pouces. Les 22, 23, 24, 25, 26 et 27, le frazil venant du Lac St. Louis en dessous de la glace, est descendu la rivière en face de Lachine en abondance, tellement que les canotiers avaient de la difficulté à transporter la malle d'un côté à l'autre de la rivière, l'eau au lieu de monter a baissée de beaucoup.

Je suggérerais que 10 piers de 50 piers carrés chaque et 10 piers de hauteur soient