mpared with the I the probability of ment being caused West.

W. R.

F THE ICE IN AWRENCE.

Illam E. Logan, read ety of London, and gs, Vol. III., p. 766, th the Author's per-Naturalist, Vol. 11I..

stands at the cona and St. Lawrence, al islands splitting , which cannot be ningled until they es below the whole come in contact in ter called Lake St. e upper part of the he southern main. here touch, they do of the St. Lawrence, ar and transparent, shore, while those r aspect, though by the banks of the of colour they pre-line of contact for

e widest part about length of twelve rrows toward the as it issues from it, to the space of half violence down the Ithough the stream f eight feet deep, it irges of nearly as sses over its rocky oot is composed of into floors that lie

f this cascade the of four miles, and it again becomes d shallows opposite om Windmill Point ove the town, sevposed of trap lying ns of low water are ace, shoot out into ards: and similar ome out from Lonore. In the narrow the water, rushing ce the Sault Norttle lower down by d several projecting St. Mary's Current. St. Helen and the an that between it ormer is so floored Lawrence has as yet produced but little effect in wearing them down, while in the latter it has cut out a channel between thirty and forty feet deep, through which the chief part of its waters rush with a velocity equal to six miles per hour. It is computed that by this channel alone upwards of a million

of tons flow past the town every minute. Between this point and Lake St. Peter, about fifty miles down, the river has an average breadth of two miles, and proceeding in its course with a moderate current, accelerated or retarded a little according to the presence or absence of shoals, it enters the lake by a multitude of channels cut through its delta, and forming a group of low flat alluvial islands.

The frosts commence about the end of November, and a margin of ice of some strength soon forms along the shores of the river and around every island and projecting rock in it; and wherever there is still water it is immediately cased over. The wind acting on this glacial fringe, breaks off portions in various parts, and these proceeding down the stream constitute a moving border on the outside of the stationary one, which, as the intensity of the cold increases, is continually augmented by the adherence of the ice-sheets which have been consting along it; and, as the stationary border thus robs the moving one, this still further outflanks the other, until in some part the margins from the opposite shores nearly meeting, the floating ice becomes jammed up between them, and a night of severe frost forms a bridge across the river. The first ice-bridge below Montreal is usually formed at the entrance of the river into Lake St. Peter, where the many channels into which the stream is split up greatly assist the process.

As soon as this winter barrier is thrown across (generally toward Christmas) it of course rapidly increases by stopping the proress of the downward-floating ice, which has by this time assumed a character of considerable grandeur, nearly the whole surface of the stream being covered with it; and the quantity is so great that, to account for the supply, many, unsatisfiel with the supposition of a marginal origin, have recuurse to the hypothesis that a very large portion is formed on and derived from the bottom of the river, where rapid currents, exist. But, whatever its origin, it now moves in solid and extensive fields, and wherever it meets with an obstacle in its course, the momentum of the mass breaks up the striking part into huge fragments that pile over one another; or if the obstacle be stationary ice, the fragments are driven under it and there closely packed. Beneath the constantly widening ice-barrier

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and crossed by hard trap rocks that the St. | than usual. The augumented force with which the masses there move, pushes and packs so much below, that the space left for the river to flow in is greatly diminished, and the consequence is a perceptible rise of the waters above, which indeed from the very first taking of the bridge gradually and slowly increase for a considerable wuy up.

There is no place on the St. Lawrence where all the phenomena of the taking, packing and shoving of the ice are so grandly displayed as in the neighbourhood of Mon-treal. The violence of the currents is here so great, and the river in some places expands to such a width, that whether we consider the prodigious extent of the masses moved or the force with which they are propelled, nothing can afford a more majestic spectacle, or impress the mind more thoroughly with a sense of irresistible power. Standing for hours together upon the bank overlooking St. Mary's Current, I have seen league after league of ice crushed and broken against the barrier lower down, and there submerged and crammed beneath; and when we reflect that an operation similar to this occurs in many places from Lake St. Peter upwards, it will not surprise us that the river should gradually swell. By the time the ice has become stationary at the foot of the Mourt Course the surprise to the St. St. Mary's Current, the waters of the St. Lawrence have usually risen several feet in the harbour of Montreal, and as the space through which this current flows affords a deep and narrow passage for nearly the whole body of the river, it may well be imagined that when the packing here begins the inundation rapidly increases. The confined nature of this part of the channel affords a more ready resistance to the progress of the ice, while the violence of the current brings such an abundant supply, and packs it with so much force, that the river, dammed up by the barrier, which in many places reaches to the bottom, attains in the harbour a height usually twenty, and sometimes twenty-six feet above its summer level; and it is not uncommon between this point and the foot of the current within the distance of a mile, to see a difference in elevation of several feet, which undergoes many rapid changes, the waters ebbing or flowing according to the amount of impediment they meet with in their progress, from submerged ice.

It is at this period that the grandest movements of the ice occur. From the effect of packing and piling and the accumulation of the snows of the season, the saturation of these with water, and the freezing of the whole into a solid body, it attains the thickness of ten to twenty feet, and even more; and after it has, become fixed as far as the eye can reach, a sudden rise in the water, occasioned no doubt in the manner menmentioned, an enormous quantity is thus occasioned no doubt in the manner men-driven, particularly when the barrier gains tioned, lifting up a wide expanse of the whole any position where the current is stronger covering of the river so high as to free and