

River tugs were in waiting, and in tow of the three tugs the whole of the expedition moved down Rainy River at 11 p.m. After running twenty five miles we camped for the night.

November 9th.—Started at 7 a.m. Run the Manitow and Long Rapids, but at the latter owing to low water, the men marched along the shore for a distance of 2 miles, leaving four in each of the boats to run them down. Reached Hungry Hall, near the mouth of Rainy River, at 7 p.m. this day.

November 10th.—Started at 2 o'clock p.m. but were compelled to camp at the mouth of the river, owing to a heavy storm on the lake. At 6 p.m. we attempted to cross the traverse, but were unsuccessful, and had to run to an island to remain there overnight.

November 11th. This morning the boats were ordered to set sail independent of the tugs, the wind being favorable. Shortly after starting we were glad to meet Lieut.-Colonel Smith, who was on his way to meet us. The majority of the boats sailed to within 15 miles of the North West Angle, and the remainder were towed by the tugs. Camped there for the night on an island. From thence as far as the eye could reach in the direction of the Angle was one sheet of ice.

November 12th.—A storm last night fortunately broke up some four miles of ice, and we started in the morning passing through the broken ice and then cut through solid ice for a distance of three quarters of a mile, a Hudson Bay Company's boat leading. (We brought three of them from Fort Francis.) The ice gradually increased in thickness, and finding it impossible to take the boats farther, we landed on an island some eight miles from the Angle. One of the tugs which had been previously started with iron made an attempt to cut through the ice, but was unsuccessful, getting completely wedged in.

November 13th.—At 1 p.m. today the troops started to march on the ice towards the Angle. Having to keep close to shore round the bay, increased the march to ten miles. Captain Armstrong with a rear guard of twelve men was left on the island in charge of baggage, stores, etc., and the voyageurs also remained to erect huts over the tugs and boats. Each soldier on the march carried his rifle, accoutrements, knapsack and blankets. On arrival at the North West Angle, the men were very tired after the march over so much ice. Several of the men were exhausted when within three miles of the Angle, but they were carried on hand sledges; piercing cold weather all day.

November 14th.—We were up at 5 o'clock this a.m. Loaded carts, one to each squad of thirteen men, and with thirteen waggons to carry half the men, started for Fort Garry at 7 o'clock a.m. The waggons relieved the marching men every hour. Arrived at Birch River (thirty miles) shortly after dark. Tents were already pitched for us by order of Lieut.-Col. O. Smith. One man attacked by inflammation of the bowels was left at the Angle in charge of Dr. Codd.

November 15th.—Reveille at 3.30 this morning. Started at five, and reached our camping ground for the night (2.3 miles from Birch River) at 3 p.m. This day was intensely cold, but the men, although weary and footsore were in good spirits. Tents were pitched here also awaiting our arrival.

November 16th.—Reveille at 3.30 a.m. Started at 5 and reached Prairie du Chevre at 5 p.m. Snow fell steadily during the day. Doctor Codd arrived at this place this

evening, bringing with him the sick man left at the Angle, and another (one of the rear guard) who was taken ill with inflammation of the lungs.

November 17th.—Snow continued falling all last night, succeeded this morning by a piercing cold wind. We intended reaching Fort Garry this evening, but owing to extreme cold were compelled to camp in the wood when within thirteen miles of the Fort. A number of the men became exhausted from cold, we took them into a shanty, and under proper treatment speedily recovered.

November 18th.—The weather last night and during the whole of the day was intensely cold. We arrived within a mile of Fort Garry at twelve noon. Here the force was ordered to fall in with arms and accoutrements, and we marched across the Red River and Assiniboine on the ice to the Fort. Lieut.-Col. Smith, the officers and men of the Garrison and a large number of the inhabitants of Winnipeg, were assembled at the Fort to welcome us. With the exception of the two already mentioned the men were in tolerably good health, considering the great hardships and fatigue which they had undergone.

The conduct of both officers and men during the whole route was highly commensurate all having worked diligently and cheerfully, and manifesting a desire to make the expedition a complete success, by endeavouring to reach Fort Garry in the shortest possible time, thus showing that Canadian soldiers are capable of enduring any amount of fatigue, and overcoming all obstacles.

I cannot close this without speaking highly of the valuable aid rendered by Mr. Dawson in every possible way throughout the whole route. He worked most energetically in sending supplies ahead, and by his personal exertions in this respect contributed much to the success of the expedition.

I have the honour to be, Sir,
Your most obedient servant,
Thos. Sporn, Captain,
Commanding Manitoba Expedition.

To Col. Robertson Ross,
Adjutant Gen. Canada, Ottawa.

TORPEDOES AND FORTS.

The *Morning Post*, writing on the next "Forts versus Guns," comes to the conclusion that both will sink into a secondary position when a new weapon, now in its infancy, is perfected. The weapon alluded to is the torpedo, the value of which is far from being duly appreciated. The experience of the late American war, however, demonstrates that a combination of forts and torpedoes will effectually prevent a fleet from passing a channel which could with almost impunity be entered if its defence were entrusted to forts alone.

Out of many examples of this fact, our contemporary mentions the case of Fort Sumter, at the entrance of Charleston Harbour into which the Federal fleet unsuccessfully attempted to force a passage in the spring of 1863. Here the channel was blocked by a barricade, as it may be called, of piles with torpedoes, so placed as effectually to resist all the efforts of the fleet to penetrate it even when the fort was in ruins and its guns had been frequently silenced. Nor can it be urged as an argument to weaken the force of this fact, that the attacking fleet was of no great strength, for it consisted of at least eight ironclad monitors, each heavily armed of which one was sunk, and others received severe injury from the fire concentrated

upon them. The point to be observed here seems to be that the forts alone could not have produced this result, even had the entrance to the harbour been barred by an armed obstruction, for such an obstacle might without serious difficulty have been removed during the night by men in craft of so small a size as to have evaded notice, or, if discovered, to have escaped damage from artillery, and its removal once effected, the ships might have run past the batteries with ease. Neither can torpedoes alone be depended upon for perfect defence, as was exemplified at a later date than the attack on Fort Sumter, by the taking of Spanish Fort by the Federals, although those engines were used to protect it. In the same war it was found that the presence of batteries aided by a partial obstruction was not sufficient to exclude a determined enemy. This was the case at the lower Bay of Mobile, which was taken by the Federal fleet, not, indeed, without loss, as one ironclad was blown up by a torpedo.

It would appear, therefore, that the only reliable defence for a harbour is a system of armed obstruction—that is to say, batteries to which torpedoes are attached, supplemented by forts on shore or floating batteries. Thus protected, fort would be practically impregnable, if not quite unassailable, and this most important object would be effected at a much smaller expenditure than the ineffectual defence by heavily armed forts would entail. Of the destructive power of torpedoes, and their utility in stopping the passage of rivers, a remarkable instance is given in a pamphlet on "Submarine Mines," by an officer of the Royal Engineers who has been the pioneer of torpedoing in this country, and his given to the subject a vast amount of careful study. In recounting the destruction of a gunboat—the *Commodore Jones*—it is stated that the vessel, which was reconnoitring, was blown up by two mines which had been dropped in the James River by the Confederates, and "on the explosion taking place, the gunboat appeared to rise and then bent a little in the middle. The movement was followed almost immediately by the explosion of the boilers, which sent everything into the air. The affair was followed by a most remarkable stillness only broken by the splash of falling bodies and fragments." The attacking Federal fleet at once beat a retreat, having lost the gunboat and nearly the whole of her officers and crew from an enemy whose presence was wholly unsuspected.

IMPROVEMENTS IN TORPEDOES

The scientific committee at Woolwich are making extended investigation into the characteristics of the several kinds of torpedoes invented under the conditions most favourable to their use. The trials are generally conducted in secret—often by night—and in the Royal Laboratory. The study of torpedoes, now that the weight of guns and the thickness of armour-plate appear to have reached their utmost limits, is assuming the first importance in naval and military circles; and a course of four lectures on the subject just delivered at the Royal Artillery Institution, Woolwich, by Mr E. O. Brown, assistant chemist to the War Department, have been attended by a large number of officers belonging to the scientific corps. Certain systems now undergoing investigation are neither new nor original; some are already in the possession of foreign Governments; and others have been too freely disclosed and exhibited that foreign officers are at least as well acquainted with them as