

ment of rivers, with short stretches of canal and locks, are comparatively cheap, and are performable to long canals for practical navigation. For coarse and bulky produce time is not of much consequence. Low rates of freight are what is wanted, and those can only be had by water carriage. Railroads never can give transit. Iron rails and machinery wear out—water never. One of the most productive wheat regions in the world is that which is drained by the Red River and Saskatchewan. But to make wheat raising profitable in that region, some cheaper mode of transportation must be provided than by rail, and at a very small fraction of the cost of building a railroad the project above mentioned could be carried out, and the commerce tributary to over three thousand miles of navigation poured into the lap of St. Paul.—*St. Paul Press.*

LEATHER CANNON.

It is generally supposed that leather cannon were invented and first used by Gustavus Adolphus, with the view of facilitating transportation by reason of the light weight. Undeniable evidence, however, of their earlier existence, though of a smaller size, is found in the *Landeshuter Harnisch-Kammer Inventarium*, of 1562, in which mention is made of a "*lange lederne Buchse mit Pulver-modell.*" Although Gustavus Adolphus improved and perfected the leather cannon which he introduced into his army in 1626, and used in the siege of Wormditt, yet neither he nor the German Freiherr Melchior v. Wurmbrandt, nor the North British Baron Robert Scot,* can be regarded as the inventors. The invention is evidently of much earlier date.

A leather mortar for firing shells, on exhibition in the Arsenal at Venice, was, the Venetians assert, made in 1319; it is very likely, however, that its origin is somewhat earlier. One is here reminded of the many substitutes for metal ordnance, especially of the wooden cannon (entirely bound with iron hoops), which are frequently mentioned in the period from 1525 to 1530.

The leather cannon varied from one to four pounders. The bore consisted of a copper cylinder, of the thickness of three fourths of the diameter of the ball used. The length of the cylinder was sixteen ball diameters, cascabel and breech were screwed into the cylinder. The vent of copper, was screwed into the breech. The entire length of the bore was covered with iron hoops, over which were wound a number of ropes, which, in turn, were covered with several layers of varnish. Over these layers another round of ropes was wound, and over this was spread a layer of cement. The process was repeated until the coat was of the thickness of two calibres—the last coating consisted of tarred leather, which gave the cannon its name. The charge amounted to one-fourth, nearly one-third, of the weight of the ball; the cannon was loaded only with canister. The canister shot, until that time only used in sieges, was introduced by Gustavus Adolphus into the field service, and consisted mostly of musket bullets, though old pieces of iron were often used. The shot was put into wooden and tin boxes, linensacks, and sometimes only in rude wicker baskets. The leather cannon of ninety pounds weight, with its light carriage, was easily drawn by two men.

The leathern cannon, however, by no

* Both M. v. Wurmbrandt and Baron Scot served in the Swedish Army under Gustavus Adolphus.

means met the high expectations entertained of them. Already in 1631 the Swedes ceased using them, because at the battle of Breitenfeld the cannon not only became so overheated that the charges ignited of themselves, but they also gave only very short and unreliable ranges.

In 1629, a certain Lieutenant Wolf Muller, of Chemnitz, circulated the report that he was in possession of a secret for the construction of a leather cannon, which had many and decided advantages over metal ordnance. The Elector of Saxony ordered Colonel von Schwabach to investigate as to the lieutenant and his secret. The report of the colonel being favourable—"because owing to their light weight, easy transportation, and saving of powder, as well as the advantages they offer in the field against the enemy, and in mountainous and swampy regions, in which latter places heavy cannon can seldom be used at all, such pieces cannot be too highly regarded, &c.," the elector ordered the construction of two leather cannon, for which were given "fifty seven florins three groschen ready money; seventeen florins, three groschen for sixty pound powder; fifty one florins three groschen for two and one-fourth hundredweights refined copper. Of the copper the copper-smith received two hundredweight, with which he made a tube four and one half ells long, weighing ninety pounds, and used twelve pounds for muzzle and vent. The waste in melting twice amounted to sixteen pounds, the remainder was left to the smith as pay for his work." The trial with these leather cannons could not have been very satisfactory, if we may judge from the following item in a record of weights of the armoury at Dresden, June 14, 1630: "Inventory of the weights of copper and powder of the burst leather pieces in the Elector's armoury at Dresden;—Copper, one-half hundred weight, twenty-six pounds; powder, thirty four pounds."

No mention being made of them at a latter period, we must take it for granted that this one failure was thought sufficient to cool all enthusiasm for leather cannon.—*Artillerie Archiv.*

THE YEOMANRY OF IRELAND IN 1793.

At a general meeting of the Royal Irish Academy, held on the 22nd ult. Dr. William Stokes, president, in the chair, the treasurer, Mr. J. R. Garstin read an interesting antiquarian military paper, being a letter of Bishop Bennet, of Cloyne, addressed to Dr. Porter, Bishop of Clogher, describing the French landing at Killala in 1793, and their subsequent progress. The letter is somewhat valuable, as it affords an insight into opinions held respecting an historical affair, the result of which had an important bearing on the future of Ireland, dating from the event in question. The landing of the French at Killala has been described from different points of view, but in the light of this letter we dare say the opinions of many people will undergo a change. It is, however, not our province to point a political moral or draw conclusions thereon. The letter, which was sent by J. G. Vesey Porter, Esq., of Belleisle, was as follows:—"Dublin, August 31, 1793. My dear Lord,—As you will probably be very anxious to hear about Ireland, I send you a few particulars of our unpleasant situation. On the 22nd, at seven in the evening, four French ships appeared in the Bay of Killala. It was visitation day, and the bishop so little expected an enemy, that the gentlemen

with him did not rise from table, and two of his sons took boat and went on board them. The French landed 200 men, who were resisted for a few minutes by some Fenibles and Yeomanry, but two or three of the latter being killed, the rest threw down their arms, and the bishop with his family, dear Thompson, Dr. Ellison, and, I believe, one or two more of the clergy, were made prisoners. The French next day pushed on to Ballina, skirmishing all the way with the Yeomanry and Carbineers, of whom we lost George Fortescue and three or four more. The country being alarmed, the enemy pressed no further on that road, but advanced on the side of Sligo, and Mr. O'Hara, with the Yeomanry of that part of the country, after some ineffectual resistance, prepared to abandon Sligo itself; but the French stopped short and retreated again to Killala. By this time their force was known to be under 1800, with nine or ten pieces of cannon; their ships sailed away. General Taylor, from Enniskillen, secured Sligo and Boyle; Hutchinson, with the garrison of Galway, advanced to Foxford Lake, with about 20,000 men and seven pieces of cannon, lay at Castlebar; and the Lord-Lieutenant collected a considerable force at Athlone to support all the three. This was a very good plan, and we all expected to hear the enemy had re-embarked or been all taken; but they were better commanded than we expected, for before our troops could contract their circles so as to act in support of each other the French left Ballina, crossed the mountains by Lake Con, where 200 men would have stopped their whole army, and fell suddenly upon Lake, with numbers nearly equal to his own. As the mountain road was so bad they could only bring two guns with them, and our artillery played on them as they advanced with considerable effect; but the Kilkenny and Kerry Militia, from cowardice or treachery, or perhaps both, took to their heels, without firing a shot. Some say they were followed by a regiment of Scotch Fusiliers (the Frasers), but this has been since denied; it is, however, certain that our army retreated in the utmost disorder, with the loss of their cannon and baggage to Tuam, and all Mayo is in possession of the French. Yesterday morning Lord Cornwallis was to advance from Athlone with 7000 men, at least 4000 of whom are British. It is quite uncertain what the enemy intend doing. Some think their point is Galway; others, that they will stand action; a third party they will push for Dublin. This much is certain, that if Lord Cornwallis receives a check, not only our property but our lives will be in great danger. The French were not joined before the action by any very considerable number of the Irish, but I fear they have increased their numbers since. We are also in fear of fresh troops from France landing every day in some other quarter; in short, you are a very lucky man to have all you love on that side of the water. Adieu! Our fate will be decided in a few days, or perhaps hours. As yet the country is quiet, and if we can master these fellows before they can get sufficiently reinforced, the expedition will strengthen instead of hurting us; but we are by no means so sanguine as we were. The French officer is a man of great talents. Before the action of Castlebar, he made his own troops and his Irish allies change coats, so the flower of the French Army got close to our troops, while we took them for a set of ragamuffins. I am afraid he will prove too hard for us.

Yours faithfully, Wm. CLOYNE."

—Broad Arrow.