Early Accounts of Visitors to Carron

relating to the production of cannon

Compiled by
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Below are reproduced a number of extracts from the accounts of the many visitors to Carron Iron Works that relate to the production of ordnance. In the late 18th and early 19th centuries the foundry was famous throughout the world and was an essential part of the tour of Scotland.

Illus 1: The Carron Company seal depicted on the central tower of the works' façade. The crossed cannon and cannonballs were chosen by Charles Gascoigne.

Visitor numbers were evidently high and as well as petty pilfering the Carron Company was concerned about industrial espionage. In April 1772 it was announced in the newspapers that the works would not take visitors on a Sunday, or at any time outside the hours of 10am and 2pm and even then admission would only be allowed by those in possession of a ticket. These could be obtained at the Carron Inn.

The following extracts are given:

1. 1771, Henry Marchant, lawyer in Rode Island.
2. 1777, William Nimmo, minister at Bothkennar.
3. 1780, Jacob Pattisson, physician.
4. 1784 (published 1799), Barthelemy Faunas de Saint-Fond, Professor of Geology in the Museum of Natural History at Paris.
5. 1799, Old Statistical Account, Larbert. Rev George Harvie.
6. 1799, Old Statistical Account, Falkirk, Rev James Wilson.
7. 1807, Rev James Hall.
8. 1817, Nimmo's History of Stirlingshire was revised.
9. 1818, Archduke of Austria's visit.
10. 1829, Stirling Journal & General Advertiser.
11. 1851, New Statistical Account of Scotland, Larbert, Rev.John Bonar.
12. 1885, William Jack's articles in the Falkirk Herald.

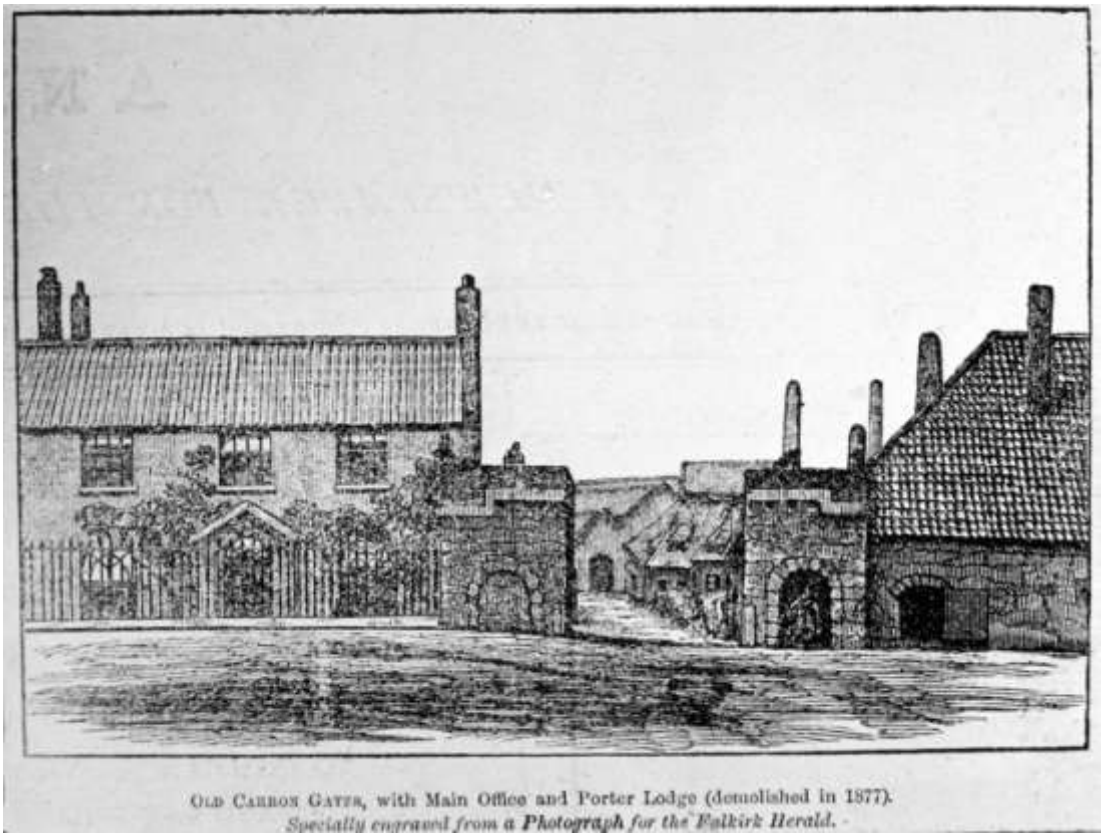
1. Diary of Henry Marchant, 16 November 1771, Rhode Island lawyer accompanying Benjamin Franklin.

"*After breakfast we went to the Works at Carron… Here we saw several cannon casting, large pans for sugar containing, pots, kettles, iron money chests, stoves and grates & c*."
(Watters 2010, 64)

2. A General History of Stirlingshire by William Nimmo, 1777.

In 1777 William Nimmo the minister of the adjacent parish of Larbert published his "General History of Stirlingshire":

"*…a great number of cannon, both for ships and forts; mortars, and other warlike implements, not only for the use of the British government, but also for that of other powers. The large demand for these instruments affords no near prospect of a speedy termination to these reciprocal jealousies which the rulers of states and kingdoms have so long entertained of one another, and which have so often deluged the earth with blood. It occasions an unpleasant reflection to a benevolent mind, that one part of the human race should find their advantage in forging instruments to destroy another; and that the demand for the horrid engines of death, should often exceed that for the utensils of agriculture and domestic convenience.*
We must not, however, omit to observe, that the skill of the artist hath lately been displayed in the improvements that have been made in the manufacturing of these instruments. Formerly they were cast in moulds, but now they are bored out of solid metal, by a machine adapted to that purpose, whereby they are reckoned to be stronger, and more capable of sustaining repeated explosions."
(1771, 463-464).



Illus 2: The main gate to Carron Ironworks with the counting house to the left and stables to the right. Miniature cannon sat above the pedestrian ports to either side of the vehicular gates.

3. Journal of tour of the Highlands by Jacob Pattisson, physician, 1780:

"*You are not permitted to enter the walls without permission of one of the Directors which I am told is never refused – your name & place of abode is formally required, - & a man attends you thro' all the works. We were first conducted to see the stores of boilers, pots, & cauldrons of an immense size, all of cast iron. We were then led to see a vast variety of Bath stoves & things of great utility & elegance which are very numerous & laid in the most regular order.*

We were informed that a great number of these are for London, many more abroad, which latter trade hath much declined since the war began. We passed thro' four large storehouses of these conveniences of life, in which we ----- new patterns of ingenious contrivances. Al this was vey pleasing, the advantages were obvious – You are next conducted to view the stores of Ball, Grape shot, Cannister shot which are so numerous & well arranged of so many horrid forms, that you insensibly withdraw shuddering from a sight so pregnant with future woe – we could at a distance see the widow, the fatherless & the kind parent deploring the evil fate of those who were dearest to them – our imaginations painted to us

the wounds & the groans of the dying – yet dark as this was, a blushing dawn seemed to arise when we thought of Liberty, a quality, without which Life is not worth the enjoying – What they call Cannister shot are a great number of Balls, or pieces of Nails, fastened tightly in a thin plate of Iron, & which Immediately breaks either when discharged from a Cannon, or the first thing it strikes against. There are another kind of Shot composed of eight short bars of Iron fitted slightly tied together which upon being discharged separates as the above. These are of different forms & are said now to be much in use for cutting the Rigging of Vessels – the most shocking of all is that to which they gave the name of Starshot. It consists of eight pieces of Iron adapted to each Star, fastened at one end with a strong single & having knobs at the other, slightly connected by a fillet of thin Iron – each of these pieces is about 12 or 14 inches long – the knobs are closed and first put into the Cannon – as soon as they are discharged they separate, yet held by the single, they whizz along & I should think would rarely fail of doing execution. We are told that they are now coming into Fashion and are charitably supposed to be used for destroying the Rigging, the French may politely design no more – but the English are barbarians.

We saw some balls of 68 lb each , which were made for some Carronades lately cast here – it is said a few of these are at present in the Navy, as they are not near so long as the Cannon formerly in use, their weight is not very great - We were next shown pieces of Cannon of all sizes. The request for these articles has been of late much greater than formerly. It is certain a considerable part of this is supplied from the Foundry of Carron.

We were informed from the best authority, that the Dutch have within this last half year purchased & taken away more than 100 pieces of Cannon with provender for each – How far it is for the Interest of Governments to permit such a traffic during wars, is not for me to say but my father, to whom I refer this will readily acquaint you. More than 9000 pieces of Cannon of different sizes have been cast within the last 5 years, most of which are disposed of, as they are cheap & being light, are managed by fewer men – Government has a great many of them, but they are mostly made use of by Privateers. The man told us they had lately received a large order from the admiralty board. We examined several of the pieces closely – they are much shorter than the Cannon generally used, & they are said to be getting into [difficulties] on this account, for it is asserted that they neither carry balls to as great a distance, nor do they hit with so great certainty as the longer ones. We did not receive this information within the works, altho' we in vain endeavoured to get it confirmed.

We were fortunate to see some 32lb balls cast. The iron is first melted & then pored into moulds, a composition of sand and clay. When the ball is cool it is taken out and finished up – we here saw a large cauldron of liquid Iron, of the most intense white heat, we approached near it, & could clearly see it boiling. We were told that this furnace needs some regulation once a day which requires a man to go into it – it is cooled as much as it can be, but yet the poor fellow must enter it insufferably hot, for 15/- a week, most of which money he is obliged to expend in liquor to keep any fluids at all in his body. The fellow came up to us & told us his story with a smile of satisfaction that surprised us – he seems [impervious] of the injury he was doing himself, but it appears a standing topic of pride with him, & like his betters he had rather sacrifice his life than his glory. His visage, & appearance is that of a skeleton – his eyes are shrunk, his voice hollow, & in singing his tale of Triumph he grinned horrible "many a ghastly smile". He is very near dried up, & I think it is not difficult to foretell his fate – the heat will certainly one day catch him like tinder, r touch paper & crackling, he will disappear.

We afterwards walked into another office & saw several moulds in which Cannon are cast. We were here likewise singularly fortunate, in seeing a six pounder gun. The mould is placed perpendicular in sand with the mouth just appearing above the surface & at about three yards distance from the Cauldron. A groove is then made in the sand which leads to it, into which liquid iron is poured, runs along and fills the mould – it was filled up in two minutes. We stood as near the operation as we dare & as bold as we were we did not feel ourselves altogether free of anxiety & dread. All the Cannon are at first cast solid, & the bore is afterwards made by means of a water engine, which last operation no person is permitted to see. A twenty four pounder is said to be done in 10 or 12 hours. This boring hath not been long in practice it was formerly the custom to cast them hollow, by which means they not infrequently burst, this is said now to be very rarely the case."

Illus 3: The scene from Hendrys Hill in 1824. In the foreground is Callendar Park with the town of Falkirk in the middle distance. Smoke billows from Carron Works in the far distance.

4. Travels in England, Scotland, and the Hebrides; undertaken for the Purpose of Examining the State of The Arts, The Sciences, Natural History, and Manners in Great Britain; containing Mineralogical Descriptions of the Country round Newcastle; of the Mountains of Derbyshire ; of the Environs of Edinburgh, Glasgow, Perth, and St Andrews; of Inverary and other Parts of Argyleshire; and of The Cave of Fingal. In two volumes with plates." The author was Barthelemy Faunas de Saint-Fond, who was a member of the National Institute and Professor of Geology in the Museum of Natural History at Paris. Although the journey was undertaken in 1784, the work was not published till 1799.

"*I passed a very instructive day at his [Swediaur's] house, and returned with him in the evening to Edinburgh. He had the goodness to accompany me back, with the intention of conducting me the next day to Carron, the visit the greatest iron-foundry in Europe, but where it was impossible to obtain admission without very strong recommendations. Swediaur was acquainted there; and I esteemed myself very fortunate in being able to make so useful an excursion under his auspices.*

From Edinburgh to Carron are reckoned thirty-six miles; but the road is excellent. Count Andreani (of Milan), Thornton (an intelligent American medical who had made the acquaintance of St Fond when

finishing' his studies in Paris), and myself set out in company with Swediaur at six in the morning. We did not alight till we reached Linlithgow where we took some refreshment. We then proceeded to Falkirk, and about half-past three in the afternoon we arrived at Carron. The soil from Edinburgh to the very entrance to Carron was strewed with large round blocks of basaltes. This volcanic lava, broke into small pieces, is used for hardening the road; and there can be no better nor more durable roads than such as are made of this substance.

Immediately on our arrival Swediaur wrote a note to a person belonging to the manufactory, with whom he was acquainted. An answer was returned, that it was necessary to leave the name, designation, and residence of each of us. The demand was instantly complied with; and a few minutes after we were told we were at liberty to enter.

A man attended us at the gate, who said that he was ordered to conduct us everywhere, with the exception of the place where the cannons are bored, which no stranger was permitted to see.

He conducted us at first into an immense court, surrounded with the high walls and vast sheds. This place was covered with cannons, mortars, bombs, balls, and those large pieces which bear the name of carronades. Amidst these machines of war, these terrible instruments of death, gigantic cranes, capstans of every kind, levers, and assemblages of pullies, serving to move so many articles of enormous weight, are erected in situations convenient for that purpose. Their various movements, the shrill creaking of pullies, the continued noise of hammers, the activity of those arms which give impulsion to so many machines; - every thing here presents a spectacle as new as interesting.

Under the sheds where the finished articles are deposited, we saw several rows of rampart cannon, battering guns, and field pieces, destined for Russia and the Emperor. They were longer than ordinary, of the most perfect workmanship, and covered with a thin varnish of a steel colour, to preserve them from rust. Their carriages were of cast-iron, and possessed the greatest simplicity of construction; they appeared to me to unite the merit of the strongest solidity, to that of being free from the numerous appendages belonging to wooden carriages, which serve only to render the working them more difficult, to obstruct their motion, and to occasion the necessity of frequent repairs.

The substance which the cannons are varnished with is kept a great secret; but I am inclined to think that it is composed of a fat desiccative oil, to which there is added a certain portion of varnish of amber, mixed with plumbago.

The large buildings where the cannons are bored are not at a great distance from the first yard. We passed close by them but were very politely told that particular processes and machines unknown to every other establishment of the kind, rendered it necessary to keep that place concealed from strangers. We thought this was very reasonable, and followed our conductor to another quarter.

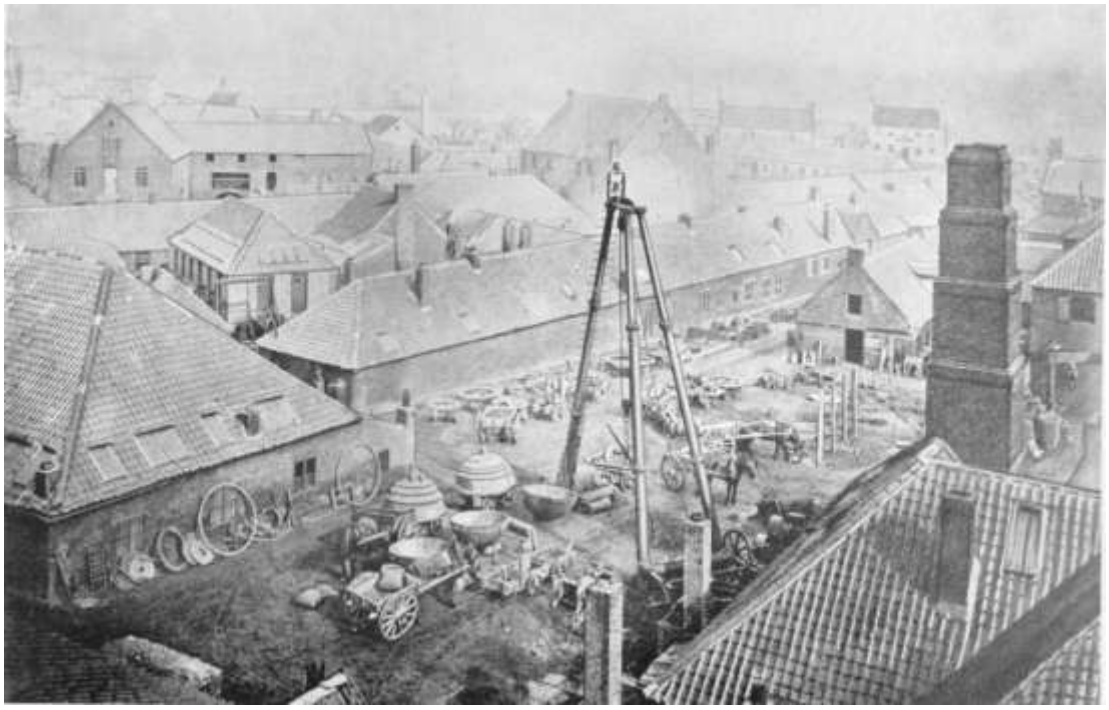
{I have seen the instruments with which cannon are bored at the foundery of Creuzot, near Montcenis, in Burgundy. The precision of these vast and superb machines, which are moved with water, raised by steam engines, is most wonderful: I doubt whether it is surpassed by the engines of Carron.}

…By the due intermixture of these three ores, there is obtained a grey, crude iron, of a good quality, which is applied to the most extensive uses. It is so soft as to yield easily to the fire; and, as it is also very pure, may be moulded into the most delicate forms.

It may be supposed, that it was not without repeated unproductive experiments, processed, and expences, that this establishment arrived, at length, at its present high state of perfection, in which every thing is appointed, every thing is executed, with such uniform precision, that nothing is entrusted to ordinary routine or chance.

The minerals are intermixed with method, carefully weighed; and put into baskets of equal dimensions. The same attention is observed with respect to the coals. Every thing is placed in regular order, within reach of the founders, under sheds appropriated to that service. The baskets for each charge are always counted out; a clock, erected near the large furnaces, determines the precise time of putting in the charge. The same form is observed with respect to the discharging of the furnaces; the stroke of the bell announces the moment when they should proceed to that operation; and every one of the workmen flies to his post.

We visited the place where the crude iron is refined in reverberatory furnaces, to be afterwards cast into cannons, mortars, howitzers, bombs, balls, & c. We saw, also, that where the moulds are prepared, and another place where they are dried."



Illus 4: As it grew over the years new workshops were added and Carron Works was a ramshackle collection of buildings. This open area was known as "the triangle".

5. Old Statistical Account of Larbert, 1799.

"*…There are also 4 boring mills, for boring guns, pipes, cylinders, & c. One of the boring mills is adapted for turning the guns on the outside*."

6. Old Statistical Account of Falkirk, 1799.

Rev James Wilson gives a full account of the works at Caron which includes this brief reference to cannon.

"*At Carron all kinds if cast iron goods are made in the best manner. A short kind of cannon called Carronades were invented there; and, in certain situations, they are considered as of great importance. They are moved in grooves; and thus the increased friction more effectually opposes the force of the recoil. The caliber of the cannon is bored out of the solid metal, and thus the hole is more smooth and just in its direction, than when cast with a core, and the piece is less ready to burst in time of action. The outside of the cannon is turned by proper instruments, and the whole is not only neat, but substantial*."

7. 1807 Rev James Hall "Travels in Scotland by an Unusual Route".

Of Carron ordnance Hall says: "*Carron Works I had seen before; but as I had not seen the boring of cannon, I went to see it again. The gentlemen here, I understand, a few years before, thought that nobody knew the boring of cannon but themselves. However, they were soon undeceived, for at Seringapatum, and among the Gentoos, whom Europeans are led to think among the most ignoble of civilised people in the world, they found the boring of cannon of all kinds not only understood, but every day openly practised, that art having been carried thither by our own good friends the French*."

8. Nimmo's History of Stirlingshire was revised in 1817:

"*Mortars, cannon, and carronades (the last being guns moved in grooves, without much recoil and deriving their names from the foundery) are cast solid in a perpendicular attitude, and bored. They are proved by water sent into the chamber by a compressing machine; a method more esteemed than the old powder-proof*." (1817, 721).

9. Visit of the Archduke of Austria in 1818:

"…the gun is placed in a horizontal position; the borer lies on a carriage, which is advanced towards the cannon; the latter turns round its axis without advancing."
(Watters 2010, 71).

10. *Stirling Journal & General Advertiser*, 1829.

"*It is gratifying to be able to state that the extensive iron works at Carron are feeling none of the general depression which at present pervades the manufacturing districts. Upwards of five months ago they received an order for field-pieces, and, though they have since been making at the rate of nearly twenty a week, the requisite number is not nearly completed. Terrible as these mortal engines are, those the Carron Company are at present finishing seem intended to be doubly destructive. Some idea may be formed of their size from the simple fact that when completely ready for use they weigh each fully three tons. A number of howitzers are also in preparation, and, instead of the usual length, from three to four feet, they rin from eight to nine, and are intended to throw shells far beyond the usual distance. Some time since, an English foundry received an order for ordnance of the same description; a few of the first made were tested in the usual way by a foreign engineer, and it is said that he was not satisfied, and transferred the order to the*

Carron Company. At any rate, an engineer, accompanied by an interpreter, lately visited Carron, for the purpose of examining these guns. After the usual tests, they were tried by one quite new to the workmen, and the scientific gentleman declared he was highly satisfied, and ordered the work to be completed with all possible despatch."

11. New Statistical Account of 1845.

Rev J Bonar of Larbert, in whose parish the works stood, had cause to write an account for the New Statistical Account of Scotland:

"*During the war, a considerable part of the iron cannon used by Government, was made at Carron, and the excellence of the guns was so uniform, that the officers of the different branches of the service gave a decided preference to Carron, over all the other foundries which were employed from time to time.*

We can attest, from personal inspection, that the guns of Duke of Wellington's battery train were all from Carron. This is not an occasion to discuss the comparative merits of brass and iron ordnance; but so conclusive has been the disquisition to the mind of the French Government, that in the year 1835, a committee of French artillery officers was permitted by the Carron Company to superintend the construction of some trial guns, which had been ordered by the French, with the sanction of our Government. This liberal conduct need not awaken national jealously, as, with regard to the mixture of ores and the composition of the metal, which is the only secret worth knowing, the Frenchmen went just as wise as they came."

12. William Jack's articles in *The Falkirk Herald*, 1885.

In 1885 *The Falkirk Herald* published a series of articles about life at Carron Works in the period from around 1820 to 1840. These were written by William Jack under the pseudonym of "Carronade".

"*Of the days, when at Carron, they were busily employed in the manufacture of munitions of war. It was with regard to their gun cutters, or the cutters for cutting tangent screws, or both, that the blacksmiths who had the dressing and tempering of these cutters, could not get the hang of the proper temper required. These cutters would stand, but not for long would they keep that keen cutting edge so much wanted in making a clean well finished job, thus rendering it necessary to keep changing and regrinding them. It would appear also that these cutters were got up in sets so that when one set was in use by the machineman, the other would be in*

the hands of the blacksmith getting re-dressed and tempered anew. It so happened on one occasion that the attendant on the machineman took a set to him, but it was found that there was one cutter awanting. He was immediately sent back for the missing cutter to the blacksmith, whose name, so far as I can recollect, was Abram Ferrier, and a famous hand he was. Abram looked for the missing cutter where he expected to find it, in his hearth, and he did find it there. So whipping it out with his tongs, he looked at it, spat on it, and was satisfied, Without further ado, he shoved it in his water bush giving it the full water, and as they were in a hurry for it, he handed it to the attendant out of his tongs, telling him to "tak it awa, it couldnae be muckle waur than the rest".

By and by when that set of cutters was being used, one of them was found to be cutting keenly, and in fact doing its work splendidly - the very thing required. So enquiries were made, and the missing cutter was recognised in this one. The others were tried in the same manner and gave equally satisfactory results. The gun business and tangent screw cutting went on swimmingly well afterwards. That simple accidental discovery proved a great saving to Carron Company, both in steel, in time, and in all times ensured a satisfactory job. It had also the influence in giving these blacksmiths a wrinkle, which was not forgotten, in the handling of a piece of steel. Any who may have got their knife rebladed by some of the old sons of Vulcan in Carron, would soon find out the superiority of the metal. Well do I remember what a Carron blade was thought to be worth in the days o' lang syne!"