

I.

ANCIENT ARTILLERY. WITH SOME NOTES ON MONS MEG.

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Artillery in the widest sense of the word—that is, offensive projectiles—is coeval with the beginnings of man: the first being who picked up a stone and threw it with hostile intent at some bird, beast, or enemy was using artillery. Gradually he came to desire greater force and precision for his missiles, and invented bows and arrows, chipping flint heads for the latter, as we very well know. The sling was also an early piece of artillery, and was employed in its primitive form long after the Stone Age, witness the celebrated combat of David and Goliath. Later the sling was developed into a very formidable weapon in the shape of the *catapultæ* and *balistæ* of the Romans—the former throwing darts, and the latter large stones, weighing, it is said, sometimes as much as three hundredweight. We are ignorant of their precise appearance, but there is little doubt that the French *trébuchet*, used in early medieval times and down to the middle of the fifteenth century, was a lineal descendant of the balista. It was a kind of sling, consisting of a long beam turning on a horizontal axis borne on its mounting. At one end was a counterweight, and at the other a pouch made of strong netting or leather in which were placed heavy stones sometimes armed with an incendiary match. They were quite formidable weapons for the time; but as they had to be firmly fixed in the ground, their range was limited and could not easily be altered, so that once the range was known the enemy could take measures to counteract their worst effects.

But artillery in the modern acceptance of the word was not possible till after the invention of gunpowder. Now, it is usually stated that gunpowder was known to the Chinese centuries before the Christian era; but the latest authorities are of opinion that this idea is without foundation. No doubt the Chinese manufactured incendiary compositions which burned fiercely and were hard to put out; they also knew how to make liquid fire, stink-pots, and other abominations which the Germans are using at the present day; but not gunpowder. They had, in short, no knowledge of what we call explosives.

Gunpowder, indeed, could not have been invented before the discovery of the art of refining saltpetre. This is believed to have been found out, according to Colonel Hime, the latest writer on the subject,¹ by Roger

¹ See Hime's *Origin of Artillery* (London, 1915), a work to which the present writer is indebted for much of the information contained in the early part of this paper.

Bacon in the middle of the thirteenth century. Its explosive property when mixed with sulphur and charcoal was probably discovered accidentally. Bacon did not publish his discovery to the world at large, for reasons which need not be entered on here, but wrapped it up in a maze of cryptic writings only to be understood by alchemical adepts like himself. But the practical application of gunpowder as an explosive force capable of expelling a projectile from some chamber or receptacle did not take place till long after the discovery of the substance itself. It is not till the year 1313 that we catch the first glimpse of the rudimentary gun. In a memorandum book of that date belonging to the city of Ghent there is

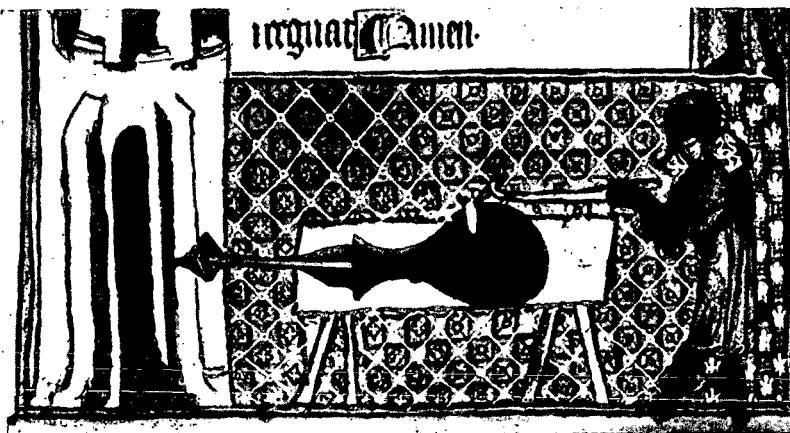


Fig. 1. Ancient Gun, illustrated in a MS. (A.D. 1327). (Reproduced by kind permission of the authorities of Christ Church, Oxford.)

an entry to the effect that "bussen" were first discovered in Germany by a monk, and in the following year it is noted that bussen and gunpowder (or "kruyt," as it is called) were exported to England. Bussen were originally a kind of hand grenade, and had long been known, so that nobody could possibly have said that they were first discovered in 1313. The word is therefore evidently used in a new sense, and is believed to mean a kind of gun. Be that as it may, fourteen years after this we have an actual picture of a gun (fig. 1). It occurs in a MS. in the library of Christ Church, Oxford, of date 1327. Whether it represents the gun sent to England in 1314 we know not, but it is archaic enough in all conscience. Imagine a large vase—a fat pot-bellied vase (indeed, the Italians called the early guns *vasi*)—laid on its side. In its neck is fitted the projectile, consisting of a kind of magnified cross-bow quarrel or dart armed with a

four-sided iron head and metal—probably brass—feathers. A tampion or stopper must have been fitted between the butt end of the projectile and the charge of powder, as otherwise the arrow would only have gone a few yards. It was fired from a touch-hole on the upper side of the vase, and we see the gunner applying his match.

Flanders became the seat of the new industry of gun manufacture. The vase-shaped guns were soon improved upon. Small tubes of iron were next made throwing leaden projectiles: they were used in groups, but they evidently did not prove very satisfactory, and the gunmakers then went to the other extreme and began to manufacture huge pieces of ordnance called bombardars. These were made of longitudinal bars of forged iron arranged like the staves of a cask, welded together and held in position by external hoops of wrought iron driven or shrunk on. Mons Meg is a good specimen of this kind of gun.

These bombardars—or at least the smaller sizes of them—were for the most part breechloaders; that is, the barrel or chase of the gun was open at both ends, the powder and projectile being put in a separate chamber open in front, adjusted to the butt end of the chase and joined to it by iron wedges driven into an external case which enclosed the whole of the breech end of the gun. At first these bombardars were simply laid on the ground on beams of wood and fired there. But the early gunners had to contend against several formidable disadvantages. In the first place, their gunpowder was of very poor quality, igniting with comparative slowness and fouling the gun terribly. It required, too, very careful ramming home: if it was rammed too loose it lost much of its expulsive power, and if too tight it did not explode at all, but silently fizzled away, and in any case a large volume of gas escaped through the touch-holes. When, about 1419, corned powder was invented, the quality was much improved, but for long its use was confined to small pieces, as the large ones were not able to withstand the shock and were liable to burst.

In the second place, the early gunners were much handicapped by their total want of knowledge of recoil. In modern artillery this is overcome by the gun more or less yielding to it, or by other and more scientific methods into which it is unnecessary to enter. But in the old days all that could be done was to make the guns overcome the shock by resisting it. So they were banked up with planking and wedges and made immovable. This, of course, imposed a tremendous strain on the guns, and they burst so frequently that they were almost as great a source of danger to their own gunners as to the enemy. The method of firing increased this danger. At first the gunner approached the touch-hole with a red-hot wire, and he was not infrequently blown to bits. Then, to obviate this melancholy occurrence, a train of slow-burning powder

was laid along the top of the gun. This being ignited at the end furthest from the touch-hole, the gunners took cover, and after the explosion they came out of hiding and, if the gun were still there, proceeded to the laborious task of cleaning it and loading it with a new charge.

A third disadvantage which the early artillery possessed was the want of change of elevation and range. But efforts were made at quite an early period to overcome this. At the beginning of the fifteenth century the gun was laid on a cradle of wood, which in its turn was supported by

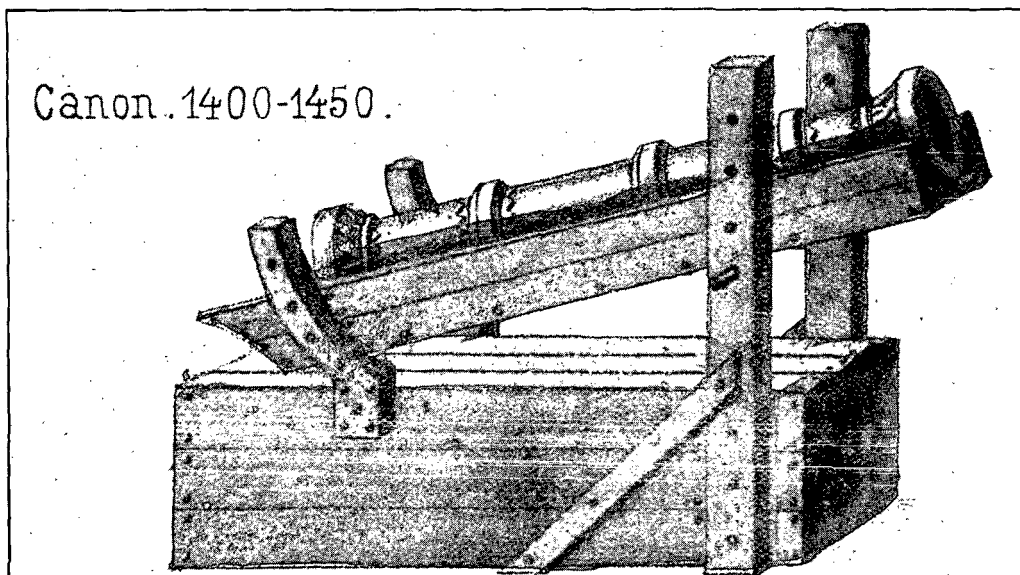


Fig. 2.

a platform. On this platform were fixed four wooden posts, the two in front being perpendicular and the two behind slightly curved. In these posts holes were pierced, and by the insertion of pins the gun could be raised either towards the muzzle or the breech as might be desired, the pins supporting the cradle on which the gun lay (fig. 2). At a later date they managed to give the gun not merely a vertical but a lateral change of range (fig. 3). The gun as before was mounted on a cradle, but the clumsy platform was done away with and its place was taken by a framework, the rear of which rested on the ground, while the front was supported by a trestle. The outside members of the frame widened towards the rear, and were connected by a curved transome in which

slid a third member moving laterally from a bolt in front. To this third member was attached an upright curved batten which enabled the gun to follow the lateral movement of the third member of the frame. The batten was also pierced with holes, and by the insertion of pins into these the elevation could be altered at pleasure.

Even at this time wheeled guns were not unknown. They were used on the Continent in 1376, and twenty years later we find wheels for bombards being made in Scotland. Another invention which much improved the working of guns was that of the trail, a solid block of wood resting on a wooden axletree. The gun in its cradle was placed on bearings on the trail immediately above the axletree. Two vertical

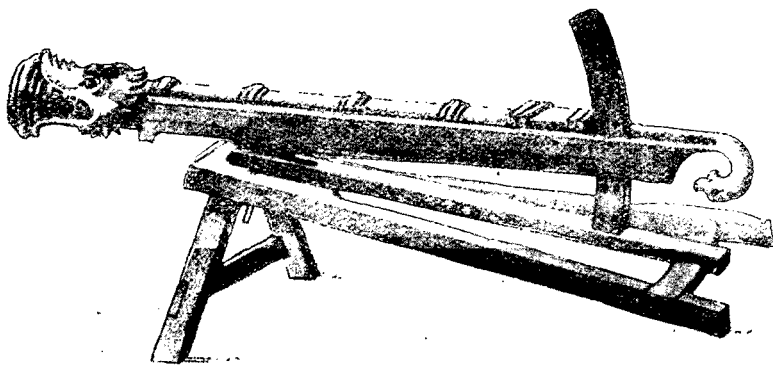


Fig. 3. Cannon, *circa* 1450. (From Moltzheim's *L'Artillerie Française* (Paris, 1875).)

pieces of wood were then placed near the rear of the trail, and the breech end of the gun, which terminated in a loop, could be moved up and down between these uprights and be fixed at the desired elevation by means of a pin passing through the uprights and the loop of the gun. The latter was secured to its cradle by means of ropes or straps, and so late as 1540 we find in the Treasurer's Accounts sums of money paid for tar to the ropes which thus bound the guns.

These methods, however, of securing elevation were but primitive and clumsy expedients. A great advance was made about the middle of the fifteenth century by the introduction of trunnions, those cylindrical projections which appear on a gun nearly half way up its length between what are technically called the reinforce and the chase. Their introduction did away with the clumsy wooden cradle, the gun carriage being now formed of two strong cheeks or sides of wood. These were secured to the

axletree, and upon them trunnion bearings were cut, the trunnions being secured in position by iron cap-squares. Elevation was obtained by the simple means of putting one or more wedges below the breech, supported by a transome.

These trunnions, placed as they were at the point where the gun received the whole force of the shock and transmitted it to the trail, overcame to a considerable extent the disadvantages of the recoil, and completely did away with the absurd system of banking up the gun from behind.

When a gun was required to travel, the trail was supported by what were called limbers. The word occurs in connection with artillery in Scotland as early as 1517, but we must not suppose that it means the

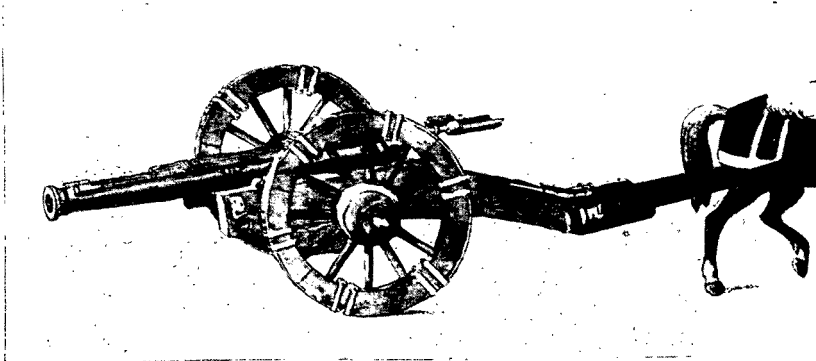


Fig. 4. Limonières supporting a Gun for travel. (From Moltzheim's *L'Artillerie Française* (Paris, 1875).)

same thing as it does now. What we understand by a limber is a couple of wheels and an axletree which supports the end of the trail of the gun. But limbers of this sort were not used in France till the reign of Louis XIV., so it is unlikely that they were used here before that time. The word is more likely equivalent to "limonières," or shafts which were attached to each side of the trail, and between which a horse was put, who thus supported the end of the trail and raised it from the ground (fig. 4). When ready for travelling, all the loose gear belonging to the gun, consisting of a shovel with which the loose powder was taken from the barrel (cartridges or shells not having yet been invented), a rod with a rammer at one end and a mop or sponge at the other, a wedge for altering the elevation, and a long rope for the purpose of assisting the horses to draw it, or to haul on as a brake when going downhill, were strapped to the gun.

The sixteenth century, too, saw guns cast in bronze come into general use. They had actually been manufactured so far back as 1444 by Jean Bureau and his brother Gaspard, but it took some time before the true proportions of the metals which should be used in the alloy were discovered. These guns, though at first by no means perfect or free from the risk of bursting, were a great improvement on the forged ones. There is a huge gun cast in Turkey by Mahomet II. in 1468, which is now at Woolwich, having been presented to Queen Victoria by the Sultan Abdul-Aziz. It formed part of the armament of the forts of the Dardanelles in 1866. Its calibre is 25 inches, the chamber is 10 inches in diameter, its length 17 feet; it weighs 18½ tons, and fires a shot of 672 lbs.

The weight and capacity of the different pieces of ordnance varied from time to time. In France, in the middle of the sixteenth century, a cannon threw a ball of about 42 lbs., a great culverin one of rather over 15 lbs., a bastard culverin about 7 lbs., a culverin moyen about 2 lbs., and a falcon about 1 lb. The names of the different varieties were often taken from snakes—thus we have Basilisks, Serpentine, Culverins (from *coulevre*, a serpent), Dragons, Aspicks; and sometimes they were taken from birds, chiefly birds of prey, as Sakers and Emerillons (both a kind of hawk), Falcons, and Pelicans.

Having now glanced at the different kinds of guns in use in the early days of artillery, let us turn our attention to Scottish gunnery. The earliest notice of a gun which I have met with in Scottish records is in the Exchequer Rolls of 1384, where four pounds were paid for "ane instrument callit a gun" for the castle of Edinburgh. At the same time £27 were spent on sulphur, saltpetre, and other things for the munitions of the castles of the King. Guns, however, had been seen in Scotland even before that date. Some small cannon were imported in the reign of Robert II., that is to say, between 1370 and 1390; and between 15th September 1382 and 30th March 1384 the Prior of Drax in Yorkshire had a commission to supply "artillery" and gunpowder for the castles of Berwick and Roxburgh, then in the hands of the English, and he got certain sums of money advanced him for the value of divers "guns" bought by John Phellipote, late citizen of London, for the munition of Roxburgh Castle.

In 1430, Bower tells us, James I. brought from Flanders a huge bombard of brass called the Lion. It may have been by the bursting of this gun that James II. was killed in 1460. In 1436, £590 were paid to Nicholas Plummer to pay workmen in Flanders engaged under his supervision in constructing bombs and other military engines. We hear of "the King's great bombard" being in Ettrick Forest in 1444;

and eleven years afterwards it took part in the siege of Abercorn Castle, where it was skilfully managed by a French gunner who "schot richt weell and faylit na schot within a faldome quheir it was chargit him to hit."

This brings us to that great piece of Scottish ordnance still in existence which bears the famous name of Mons Meg (fig. 5). The popular and patriotic tradition is that when James II. besieged the rebellious Douglases in the castle of Threave in Kirkeudbrightshire in the year 1435, the artillery brought having proved ineffective, a local blacksmith

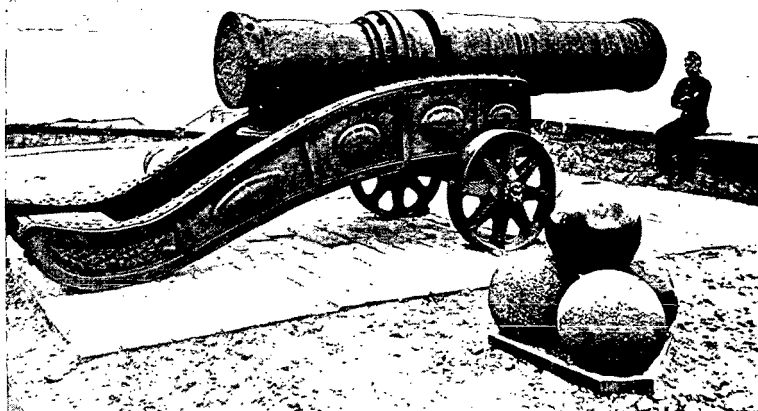


Fig. 5. Mons Meg.

[Photo by Wilson Bros.]

named M'Kim and his sons offered to make then and there a bigger and more powerful gun than any the King had, and produced in a short time this mighty specimen of their skill, the surrounding population contributing each a bar of iron for its manufacture. It is also said that the blacksmith was ultimately rewarded with the forfeited lands of Mollance—whence Mons,—and that he called the gun after the name of his wife. As further proof of this tale it is also stated that only two shots were fired from the cannon before the castle capitulated, that both these bullets have been found, and that they correspond to those still preserved in Edinburgh Castle, which are of Galloway granite from the summit of the Binnan Hill near Carlingwark. The story continues that during the making of a road in the locality the

mound on which the gun was made was uncovered and found to consist of a mass of cinders and the iron debris of a great forge.

There is another mound in the locality which bears the name of Knockcannon, which is said to be the place on which Meg was put in order to fire at the castle; but, as Sir Herbert Maxwell says, this is suspiciously like the usual attempt to explain a name by reference to some familiar or notable incident. Its more likely derivation is from the Celtic *cnoc ceann fhionn*, hill of the white top. Or it may possibly be the hill of St Finnan, whose cult was by no means unknown in Galloway.

The charge of powder required for Meg is traditionally said to have been a peck, and her granite ball to have been equal in weight to a Carsphairn cow. In such fashion do legends take shape.

There is, however, a great deal to discredit this tradition. It is extremely unlikely that a village smith and his sons could have made such a large piece of ordnance with the means at their disposal, as it would really require the appliances of a first-rate forge.

Here are the actual dimensions, taken from an official description of her drawn up in 1734. The length of her chase was 9 feet $2\frac{1}{2}$ inches, of the chamber 3 feet $8\frac{1}{2}$ inches, total length 13 feet 4 inches; diameter of bore 1 foot 8 inches, of chamber 9 inches; the weight of her bullet in iron 1125 lbs., in stone 549 lbs.; her whole weight, 19,452 lbs. or about $8\frac{1}{2}$ tons. It took 105 lbs. of powder to fill her chamber when rammed; her greatest range when at an elevation of 45 degrees was 1408 yards with an iron bullet, and 2867 yards with one of stone; to travel these distances an iron bullet took 16 seconds and a stone one 22; compared with a cannon royal at the same elevation, her force with an iron bullet was as 9 to 1, and with a stone one as 6 to 1.

She is stated in this memorandum to be in all probability the biggest gun ever made in the world, but this is not really the case. "Mad Marjory," a big gun at Ghent forged in 1452 in the same fashion as Mons Meg, was probably bigger, and there were other big guns in Europe: one at the Dardanelles had a bore of 30 inches in diameter. Mons, it is said, "has been all hammered, as appears by her chase, which is composed of long flat iron bars and hoops driven on them, so all forged together. But no joining of hoops is to be seen in her chamber or hind part: therefore it is very probable that that part was first made, then joined to her ribs or bars and the hoops afterwards drove upon these bars, as is more confirmed by the small holes on her base and reinforce rings, being designed for turning her when these parts were joined."

One thing the memorandum proceeds to say is that "in the position she now lies, the horizontal diameter of the muzzle exceeds the perpen-

dicular diameter thereof near half an inch: therefore can be accounted for no other than yielding with her own weight lying so long in one position: for the base ring which is solid there is no sensible variation from a circle."

The memorandum goes on to say, on the authority of a MS. in the Advocates' Library, that the name Meg was given it by James IV. after his wife Margaret Tudor, and further attempts to explain the word Mons; but as all this is absolute nonsense, I need not expatiate further on it.

The first time this great gun appears under the name of Mons is in 1489, when the gunners got 16s. when they "cartit" Mons either to the siege of Duchal Castle or to that of Dumbarton. Quite a lot of money was expended on her when she was taken to the siege of Norham in July 1497. Four great cables weighing 16 stone 5 lbs. were provided for her at a cost of £3, 5s. 8d. Her exit from Edinburgh was made with great pomp, and she was dragged down the High Street with minstrels playing before her and taken to St Leonard's, where she was fitted with a new "cradle" or gun-carriage. She was carefully watched for five nights, and started on her journey south on the last day of July. Her retinue was imposing. One hundred workmen attended her, armed with spades and picks to clear the way, as no doubt it was an arduous undertaking to get such a monster along the primitive roads of the period. She was covered with eight ells of painted canvas, and her wheels were plentifully provided with tallow and tar. Her well-being was also looked after by several specialists, three wrights and two smiths accompanying her in case of any accident. We are not told what motive power was used in her transport,—whether she was pulled along by oxen, as was the usual method, or dragged by the hundred attendant pioneers. We are not even told if she ever got to Norham, which did not at this time fall into James's hands. A singular fact is that John Ramsay, Lord Bothwell, who was at this period acting as a spy in the pay of the King of England, gave in a report of the ordnance he had seen in Edinburgh Castle, but he makes no mention of Mons. The artillery he saw consisted of "two great curtals or short cannon sent from France, ten falcons or light cannon, thirty cast guns of iron with chambers, sixteen close carts or tumbrils for spears, powder, stores, and other stuff for loading guns."

Mons came back to Edinburgh in September, and we do not hear of her again in the Treasurer's Accounts till 1501, when a wooden house was built in the Castle for the accommodation of herself and two sister guns called respectively Messenger and Talbart. It appears that they were all lying ignominiously in the dust, and 3s. 2d. had to be paid for "casting of the erd from Mons and to turn her and lay the twych hole up." The guns too were

given a coating of red lead and linseed oil to preserve them from rust. In 1526 and 1539 we again hear of attention being paid to her in the way of red lead and lubrication. But one of the most curious incidents in her career is the part she took in October 1680, when poor old Meg burst while firing a salute in honour of the Duke of York. She was removed to London in 1754, but restored to the castle of Edinburgh in 1829, where the ancient and interesting relic still remains.