

# *A 16 th century Portuguese bronze breech-loading swivel gun*

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## INTRODUCTION

In the late 1890s British forces attacked and sacked Benin city in Western Africa. Amongst the booty taken were a number of pieces of artillery including a small bronze swivel gun which is the subject of this short article.

## DESCRIPTION

The gun is a single bronze casting, now 162cms long overall. The barrel is approximately 114 cms long with a bore of 5 cms (figure 1). At the muzzle are a series of simple decorative mouldings and the barrel flares slightly and ends with a plain tubular shaped ring. On the barrel are three emblems: the first at the rear is a rectangular cartouche in which are the letters COF(?R); forward of this is an armillary sphere; and at the front the arms of Portugal (figure 2). The trunnions, cast in one with the barrel, are at 59 cms from the rear of the piece. The Iron swivel is still in place. The barrel is damaged at approximately half its length where there is a hole in the wall of the barrel about 5 cms in diameter.

The powder chamber holder, at the rear of the barrel, was cast as an integral part of the gun. It is approximately rectangular in plan, 46 cms long by about 18 cms wide overall. At its rear on either side is a slot, about 7.5 cms long by 4 cms wide, into which the wedge was inserted to secure the

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powder chamber in position for firing. The inner front part of the chamber holder is tapered to take the mouth of the powder chamber which, from measurement, would have been approximately 35 cms long by about 12 cms in diameter. There is a roughly-cut rectangular hole in the bottom of the powder chamber holder. On the rear face, which is roughly semi-circular in shape, is a raised circular projection with a hole through its middle. This was to take the iron tiller with which the gun was aimed and which is now missing. There is a cross-shaped mark on the top face of the rear of the chamber holder.

### ORIGIN OF THE GUN

The gun was found in Benin and brought back to England at the end of the 19th century, since when there has been some doubt as to its origins, European or West African. Its African provenance would suggest that it was cast in Benin where there was, for a considerable period, a thriving bronze casting industry. However the arms of Portugal on the barrel would suggest that it was made in Portugal and either traded, lost or used by the Portuguese on the west coast of Africa. This assumption is reinforced by the additional marks of the armillary sphere and the letters COFR, presumably the founders monogram. The former, the armillary sphere, is found on a wide range of other Portuguese guns and appears to be a device associated with the crown of Portugal.

The monogram CFRO has been found on guns from a Portuguese ship wrecked off the coast of South Africa (Auret and Maggs, 1982; 6-7). However, whereas on the British Museum gun the letters are contained within a rectangular frame, these are within a shield shaped frame. Very similar bronze swivel guns, though with the letters CFR within a shield, have also been found on a Portuguese wreck in the Seychelles (Blake and Green, 1986; 8-14). It is not clear whether this is the same monogram, as the letters are worn and difficult to read. It is possible that the monogram was originally CFRO and the last letter has been mis-read or rubbed away. However whatever the monogram, CFR or CFRO, the form of the bronze guns on which they are found are very similar. This evidence would point to the being of Portuguese origin.

The metal of which the gun was made was analysed in an attempt to ascertain whether the metal had originated from either Europe or West Africa. The metal has a very high copper content with about 2% tin together with small amounts of lead and antimony (for details see appendix 1, below). Unfortunately the amount of comparative material is very small. Craddock and Picton (1985 and Craddock, 1985) suggest that after 1500 most Benin material was generally made from brass, that is copper and zinc, in which the amount of zinc varies considerably. The composition of ingots recovered

from the wreck of the *St Anthony*, which sank in 1527 on its way from Antwerp to Lisbon, is very close to the British Museum piece though there is more tin in the cannon than in the ingots, though this may have been added deliberately in the founding process (Craddock and Hook, 1987). The composition of the metal, though not conclusive, does indicate a European rather than African origin.

The Royal Armouries also possesses three small pieces of artillery which were captured in Benin in 1897 (Blackmore, 1976, 154, 170). Of these the first, a small iron gun, is probably Chinese as it is similar to other Chinese pieces and also has an inscription in Chinese characters. A second piece, also of iron, is possibly an oriental or African copy of a European original. The third is a bronze swivel gun which superficially is similar to the British Museum gun. A number of features however lead to the conclusion that it is more likely to be of African origin. The presence of these objects with such a wide range of provenances would seem to indicate that the presence of a Portuguese gun in Benin would not be out of the ordinary. An unusual example of the movement of objects was the discovery of a late 14th century copper alloy jug, now in the British Museum, in the palace of Ashanti King Prempeh at Kumasi, Gold Coast (now Ghana), in 1895 (Alexander and Binski, 1987, 525; Read, 1898).

## DATING

The armillary sphere has been suggested to be a device closely associated with King Manuel I of Portugal, 1455-1521, and that guns with this device date from this period (Blackmore, 1976: 139-140). However it is clear that guns were also marked with the armillary sphere later in the 16th century. For example an iron gun from the wreck of the *Mauritius*, dated 1587 (L'Hour, 1987: 119-121; Smith, 1991, 38-9), as well as two guns in the Military Museum in Lisbon, one dated 1550, the other 1575, all include armillary spheres as part of their decoration (Lisbon, 1930). Apart from these dated examples a large number of other Portuguese pieces also have the armillary sphere device and it would appear that it was commonly used on Portuguese guns during the 16th century. Auret and Maggs (1982, 6) suggest that the armillary sphere was used in the reigns of Manuel's successors, John III (1521-57) and Sebastian (1557-78), but that in general it was not used in conjunction with the royal coat of arms. However a survey of the guns in the collection of the Military Museum in Lisbon would indicate that it was common to include the armillary sphere and the royal coat of arms after the reign of Manuel I (Lisbon, 1930). For example a swivel gun, very similar to the British Museum piece, found in the Bay of Cadiz, has, in addition to the arms of Portugal and

the armillary sphere, the name IODZ, probably the mark of the founder Juan Diaz (Mora-Figueroa, 1993). A gun with IODIZ dated 1575 is in the Military Museum in Lisbon (Lisbon, 1930, 189-190). It is clear then that the presence of the armillary sphere cannot be used to closely date this cannon.

The founders monogram, COFR (or CFRO), might hold some clue. The only other guns with this mark are those recovered from the wreck of the *São Bento* in South Africa which has been dated to the mid-sixteenth century (Auret and Maggs, 1982). As stated above, however, the monogram on these latter guns is contained within a shield shaped cartouche so that there is a possibility that it is not the mark of the same founder.

The letters CFR within a shield, in conjunction with the armillary sphere and the Arms of Portugal, also occur on some Portuguese guns; for example a gun in the collection of the Military Museum in Lisbon dated 1550 and an undated culverin with the same mark. There are also several undated swivel guns, similar in many ways to the British Museum piece, which have the same shield and CFR mark. These include one found off the Goodwin Sands in the late 18th century (King, 1779), and guns found on the wreck in the Seychelles described by Blake and Green (1986, 8-14). Several other, undated, bronze breech-loading swivel guns of very similar form can also be found in artillery collections in Europe including Berlin, the Royal Armouries in London and Madrid. These and the other pieces already mentioned are summarised below:

Gun	Number	Length	Bore	Marks	Reference
British Museum	1899,6-10,1	160	5	Arms of Portugal, armillary sphere, COFR in rectangle	
Natal		264	7.5	Arms of Portugal, armillary sphere, CFOR in shield	Auret and Maggs, 1982
Goodwin		217	4.5	Arms of Portugal, armillary sphere, CFR in shield	King, 1779
Seychelles	A	259	6.9	Arms of Portugal, armillary sphere, CRF?	Blake and Green, 1986
Madrid	1042	140	5.5	Arms of Portugal, armillary sphere, P	Madrid, 1909, 17
Berlin		203	4.8	Arms of Portugal, armillary sphere, L	Post, 1921-2
Lisbon	B1	163	5.2	Arms of Portugal, armillary sphere	Lisbon, 1930
Royal Armouries	XIX 90	239	11	Arms of Portugal, armillary sphere	Blackmore, 1976
Cádiz		281	11.1	Arms of Portugal, armillary sphere, IODZ	Mora-Figueroa, 1993
Seychelles	B	159	4.7	Arms of Portugal, armillary sphere, OC	Blake and Green, 1986

## CONCLUSION

Taken all the evidence together it would seem to indicate that the gun is of Portuguese origin. It is identical to other Portuguese pieces, its analysis is consistent with it being Northern European and there is no reason to wonder at the presence of a European gun in this context. It should also be noted that if it had been made in Benin it would have to be supposed that there was another gun from which this one was copied, complete with all the same markings, a supposition which, though possible, is extremely unlikely. Much of the evidence for dating this piece is inconclusive and rather serves to confuse the problem rather than to clarify it. It is clear that it need not be dated to the reign of Manuel I, 1495-1521, but could date from later in the sixteenth century, possibly as late as 1578 the death of Sebastian—or even 1587—the date of the iron gun from the wreck of the *Mauritius*. Recent work on wrought-iron swivel guns has suggested that iron guns of very similar form were in use in the 16th century, though the exact dating is still not clear (Smith, forthcoming).

## Appendix 1 Analysis

A small sample of the metal of the British Museum swivel guns was removed for analysis by energy dispersive X-ray fluorescence spectrometry (XRF). Comparable data with which to compare these results is unfortunately limited. Craddock and Hook analysed a group of copper ingots from the wreck of the *St Anthony* which sank in 1527 en route to Lisbon from Antwerp (Craddock and Hook, 1987). These analyses are summarised below:

	<b>Cannon</b>	<b>Ingots</b>
Copper	97%	95.2-99.9%
Tin	2%	<0.15%
Lead	0.5%	0.42-1.69%
Antimony	0.2%	0.26-0.51%

The analysis of the ingots also included traces of other elements, zinc, silver, iron, nickel, arsenic and bismuth all of which were not looked for in the analysis of the cannon metal. Except for the increased amount of tin, which could have been added during the casting of the gun, the compositions of the two are very similar. As far as I am aware there are no analyses of 16th century cannon for comparison. A number of bronze guns in the collection of the Army museum in Stockholm have been analysed but these were 17th and 18th century in date (Forshell, 1984; 1990)

In addition surface analysis of the bronze swivel gun in the collection of the Royal Armouries which was found in Benin, XIX 113, was carried

out for comparison purposes by energy dispersive XRF. Both the barrel and the tiller, which was a separate casting, were analysed as it had been suggested that the tiller had been added to the barrel at a later date.

	<b>Barrel</b>	<b>Tiller</b>
Copper	84%	78%
Tin	10%	14%
Zinc	2%	2%
Lead	2%	3%
Antimony	0,6%	1,2%
plus traces of iron, nickel, and arsenic.		

This swivel gun is unlike those discussed in this paper; it is completely unmarked, the tiller at the rear is of bronze, the outer surface is rough and unfinished in appearance and very unlike other European guns. The analysis on its own does not help to clarify the situation. However on balance I am of the opinion that this piece is African or far Eastern in origin, and copied from an European original but this is not certain.

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Figure 1. *The swivel gun from the British Museum (© The British Museum).*





*Figure 2.—The marks on the barrel (© The British Museum).*