

First Steps Towards an Introduction Into the Study of Early Gunmaking in the Portuguese World, 1450-1650.

by Rainer Daehnhardt

It had been suggested by a close friend of mine that a short preface to this study should clarify the technical specification of the term "flintlock."

The name by itself explains that it is an ignition system for firearms in which flint is being used. This separates the flintlock from the matchlock and the wheellock.

Torsten Lenk, who was the first to dedicate many years of study to the evolution of flintlock firearms, defines the flintlock as having a combined steel and pancover and a vertical working sear.

This definition was fine to separate the snaphaunce locks but it started to puzzle all students of the history of firearms when the early forms of Portuguese flintlocks were discovered:

Nowadays we set the definition in the following way: If the steel and pancover are combined and the sear works vertically in the French way we speak of a *true flintlock* or a French type of flintlock.

If the steel and pancover are divided we speak of a snaphaunce lock:

If the steel and pancover are combined but the sear works in another way, different from the French type, then we call the lock by the name which it originally had during its working life, but we still consider it a flintlock:

The variety of such locks is quite large. In Portugal alone there were used 17 different types of flintlock mechanisms, each of them having its own name.

Two of these types of flintlocks appeared in the early XVIth century and predate the generally known history of flintlock firearms for almost a century.

The following study is just an introduction into this new and hitherto unknown chapter of early gunmaking.

Portugal, a small country, by itself insignificant, became of high importance in the 15th and 16th centuries. This rise in importance was due mainly to the efforts of one man, namely, Prince Henry the Navigator. This young idealist, who was a son of King John I of Portugal, along with his wife, Felip of Lancaster (the granddaughter of King Edward III of England), decided to build a college for navigation.

His famous school in Sagres brought up generations of discoverers who opened a complete new world to old Europe. Prince Henry's desire to learn was so immense that he sent friends all over Europe to bring back as much knowledge as possible about various fields, such as: astronomy, navigation, shipbuilding; or anything else which could be of the slightest interest to him. As a result, he managed to acquire a remarkable collection of early maps and manuscripts. Among these was the original manuscript written by Marco Polo, concerning Far East travels. This manuscript was presented to the brother of Prince Henry by the town of Venice. The school of Sagres, by the middle of the 15th century, included not only a school for map reading, navigation, shipbuilding and sail-

ing, but the school also included courses in astrology, cosmography and meteorology. Prince Henry accepted many foreigners as instructors. These teachers were specialized in the various fields and managed to join the highest level of collected and applied wisdom of seafare in his time. Many fleets were equipped and sent out by him in different directions just to complete his knowledge about the blank parts of his maps. His ships discovered all the East Coast of Africa, as well as the Azores, Madeira and the Cape Verde Islands. The ships of Prince Henry were often engaged in battles against the Moorish vessels. Prince Henry therefore equipped his ships for naval warfare. His ships were always outnumbered by the enemy, therefore he equipped them with well trained men who were soldiers as well as sailors. This was quite unusual for that period. Prince Henry died in the middle of his work in 1460, but his instructions continued in force for a very long time in both Lisbon and Sagres.

As a result of this, most people today hold the Portuguese navigators responsible for the discovery of much of our world. It is still generally unknown, however, that the main strength which made this possible was attributed to



the advanced technical navigational knowledge with which these Portuguese navigators were equipped.

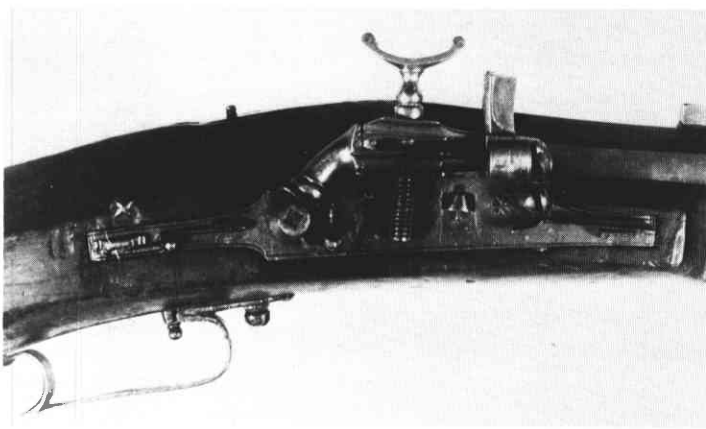
It may be accurately stated that the equipment of Prince Henry's navy, and that of his followers in the next century, was about 70 years ahead of most of the other nations. This tremendous advance helped to build up the naval connections, worldwide, which belonged to Portugal until 1580.

This study merely opens light on the aspect of the evolution of Portuguese arms of this period. A study regarding nautical instruments, shipbuilding, and navigation would come to similar results.

Until the beginning of the 15th century, nobody ever thought of firing a heavy cannon from a ship. It was generally believed that the ship would turn over at once — so nobody even tried. As the shooting of burning arrows, crossbow bolts or short range hand guns was the common start of a naval battle before the boarding from one ship to another, it was quite a surprise when Prince Henry's ships were suddenly equipped with heavy artillery. The result was the defeat of most enemy ships before they even got in range to use their crossbows or catapult war machines.

At the end of the 15th century, the King of Portugal, Manuel I, gave the order for the manufacture of very large bronze breech loading cannons. Many of his ships were equipped with these early breech loaders, each of which carried twenty already loaded, separate breech chambers. A contemporary letter of the gun founder to King Manuel labeled the king as being the inventor of this system. The letter, which was very flattering to the king, showed the good results obtained. It goes without saying, the king was most interested in these new breech loaders, and gave his full support for their manufacture.

By the year 1500, the Portuguese ships were up to 80% equipped with large bronze breech loaders, several of them are still in existence, and many may be found by divers. The main advantage of the breech loaders was not only the speed of sequence of firing, but also as it avoided the long guns to be loaded from the outside of the border of the ship. In 15th century vessels, there was no space to recoil the guns for loading and the men who had to do the job were dangerously exposed to enemy bullets and



The earliest known flintlock. Made by German gunmaker in the Lisbon arsenal between 1530 and 1550.

arrows during the loading procedure. So the large breech loaders saved both time and men.

This difference of equipment does not seem very important today, but in its time it meant a tremendous advantage for the Portuguese navigators. This gave them the courage to fight and win against enemy forces ten times their superior.

The Lisbon arsenal, one of the largest of the time, was not only a depot of imported weapons, but was, since its early beginnings, a technical school for high quality army equipment. Manuscripts reveal the existence of German, Dutch, French, Italian and Spanish masters of the art of gunfounding and barrel forging.

Foreign gunmakers wishing work in Lisbon, enjoyed special privileges such as large tax reductions. In the early 16th century, the German artillerymen in Lisbon were so large in number that they formed and organized the Brotherhood of Saint Bartholomeus, for which they erected their own church. This church is still in existence today. In the Battle of Alcacer-Quibir, 1578, some 3000 German artillery men lost their lives fighting for the King of Portugal. Many of the earliest Portuguese gunmakers known were of foreign origin. Let's look at the names and dates of some of them:

- 1443 JOHANNES HANS, German
- 1451 ALFONS HANS, German
- 1472 MARTIN HANS, German
- 1542 JOAO DE CAVIANE, Italian
- 1543 FRANCOIS DE BELIANTE, French
- 1558 HEINRICH LAMBERT, German
- 1572 HENRY DE BRUXELLES, Flemish
- 1575 JACQUES SIMON, French

Unhappily, no lists of these early gunmakers survived. We can only come across their names in old church and court registers where sometimes their professions were mentioned.

King Manuel I (1495-1521) not only gave privileges to foreigners, but also offered them very high payments just to settle their workshops in Lisbon. So we find plenty of German book printing offices, watch makers and gunmakers in Lisbon in the early 16th century. Lisbon became rich through the discovery of the route to India. This was attributed to Vasco da Gama in 1498. Many foreign craftsmen came to serve the King of Portugal and to share the splendor of a new rising star. The terrible effect of fanatic persecution by the inquisition in Spain was another reason for the many good craftsmen to venture to Lisbon. Many of them were goldsmiths, silversmiths, watchmakers and gunmakers.

In the year 1500, the population of Portugal numbered 1.5 million. Eighty years later this number went down to 1.2 million. The missing 300,000 represented that part of the population which left old Europe and settled throughout the Portuguese-discovered islands in the Atlantic, in Brazil, Africa and Asia. All these pioneers were equipped with weapons. From Brazil to Japan, everywhere the Portuguese went, they built missionary and commercial exchange points, usually always defended by a fortress.

The age of the "Conquistadores" began, but there was a main difference between the Spanish and the Portuguese procedure. The Spanish Conquistadores imposed their faith to the natives and struck tremendous battles to conquer their gold, killing most of the population. The Portuguese were well aware how small and outnumbered they were so they neither imposed their faith nor conquered any countries. They got all they wanted by trading merchandise, so most of them were merchants, but not conquerers.

Portuguese navigators were the first to introduce firearms in Japan and in Ceylon. They did this by trading the guns against local products and not by killing the population as Cortez and Pizarro did in Mexico and Peru.

The tremendous need of firearms in Lisbon could not be satisfied by local production, so very large quantities of firearms were imported, mostly from Bohemia. There are still bills-of-sale in existence of the early 16th century, showing the acquisition of many thousands of matchlock muskets from Bohemia. As some of these were traded by the Portuguese in Japan and Ceylon, we find that all Japanese and Singhalese matchlock guns are copies of those Bohemian snap-matchlock muskets used by the Portuguese.

In Turkey, Persia, Arabia, and in India, firearms were already in use before the arrival of the Portuguese who had to fight against them. The Turkish and Indian matchlock guns are copies of an earlier model of the European matchlock. These were in use in Germany about 1470 and worked in a different way. The disadvantages of the matchlock are so obvious that they do not need to be explained. A true firelock was necessary to ignite the charge at once, whenever needed.

Much already has been said and written about Leonardo da Vinci's invention of the wheel lock. The wheel lock is, without any doubt, a very interesting and effective ignition system, which I personally like so much that it is my greatest pleasure to go hunting with a wheel lock rifle. It is my opinion that the early wheel lock and the early matchlock are normal evolutions which had to be expected, and are not the result of sudden genius.

Different systems of lighters or firestrickers were commonly known and used in the late 15th century. Depending on the more easily available stone, they based in the central European countries on the scratching wheel system on pyrite. In the Iberian Peninsula, because of the very strong Iberian flint, they based on the striking movement of a steel against a flint.

There was no pyrite to be found in Portugal. The lighting procedure consisted of lighting the fire by holding a match with a flat flint on top with the left hand, while striking against it with a steel ring with long flat surface. This was held by two fingers of the right hand. We can see the evolution of this commonly used mechanism, simply the inversion of the movements, i.e., the flint strikes the steel. If you have a snap-matchlock, of about the year 1500, having a strong spring and place an Iberian flint in the jaws of the cock instead the match, you get sparks

enough to ignite the charge just by letting the cock hit the flint in the pan. This proved successful during repeated testing. This mechanism is considered, therefore, to be the earliest form of all flintlocks. This snap-matchlock, by adding a steel to the pan cover, becomes, in reality, an actual flintlock.

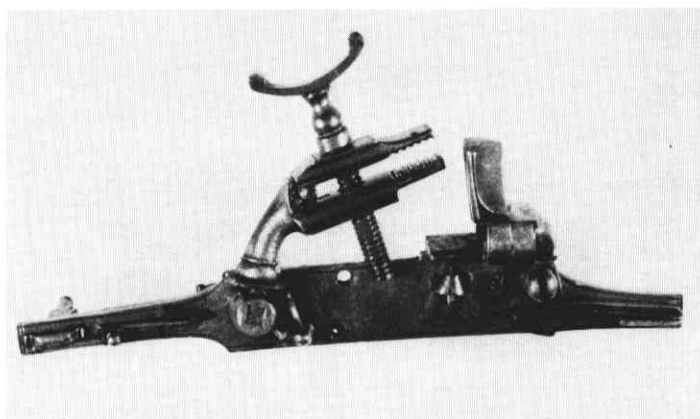
Without having definite proof, it is difficult to state whether the flintlock came first, or if it was the wheel lock. Both appear, however, to be contemporaries.

Until quite recently, most firearm literature introduces the flintlock around the year 1630, in France. The flintlock of 1625, in the Hermitage, and the one owned by Louis XIII, coming from the Renwick collection, were generally believed to be the earliest flintlocks known. A still earlier flintlock pistol, however, vintage 1605-1610, in the Keith Neal collection, can be called the earliest known French flintlock pistol. But there were other countries making flintlocks long before this time.

My friend, Dr. Arne Hoff, director of the Töjhusmuseet in Copenhagen, already pointed out the existence of the ignition systems using flints, namely snaphaunce locks, in Scandinavia as early as the middle of the 16th century. One datable example of 1556 is still in existence in the Livrustkammeren in Stockholm and there are several examples toward the end of the century. None of these specimens are the invention of a high quality gunmaker. All are simple, which shows that they were made not by any famous genius for somebody of importance, but by average gunmakers. This means a generalized use of these Scandinavian snaphaunce locks in the second half of the 16th century.

Dr. Arne Hoff deserves the merit of having proved the existence of 16th century snaphaunce locks. This was quite a revelation for many gun collectors. Dr. Hoff was quite surprised when shown a fairly large collection of early manuscripts, showing the existence of the flint ignition system in the 16th century Portugal. Several of these documents, which quite distinctively speak about flintlocks (Espingardas De Pederneira), in comparison to matchlocks (De Mecha), or wheel locks (De Roda, De Corda Oiz De Rodete), are dated:

1548 1555 1556 1562 1578.



Portuguese flintlock (so called: "molinhas" or spring lock). About 1530-1550

These documents do not make any distinction between the flintlock and the snaphaunce lock, for the simple reason that the snaphaunce lock was not used in Portugal. The discovery of additional documental proofs of the existence of such early flintlock weapons started our worldwide research to see if such weapons were still in existence. Luckily, several of these examples have been found. The earliest of these can be considered as being a sensational discovery for the study of the evolution of firearms, as it predates the flintlock about 70 years. It is a long holster pistol made in the Lisbon arsenal between 1530 and 1550. As it is such an outstanding example of an early flintlock without having others to compare, the only way of dating it was to take it apart and to date it piece by piece.

The word "pistol" was not in use when this example was made. We have a manuscript of that period, however, which speaks of: "A tiny arquebus to be carried in a sleeve or small saddle holster."

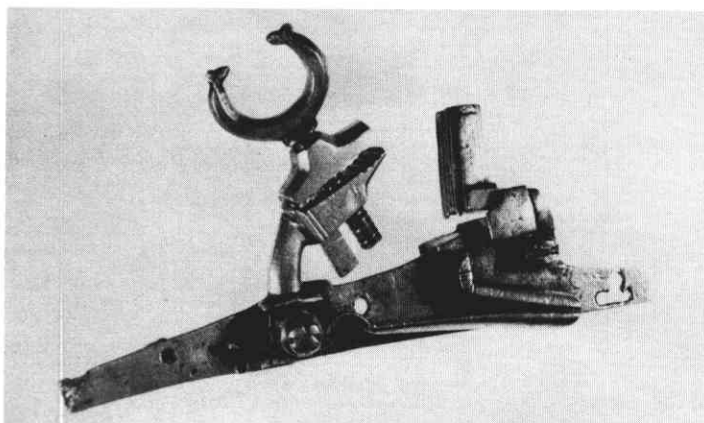
A pistol of over 20 inches cannot be called "tiny" but in comparison to the heavy arquebus of those days, it may well be called a "tiny arquebus." This is especially true when we consider the shape of the butt, which is an exact miniature version of the shape of the large gun butt. The stockmakers were still in the inventive stage. The large and cumbersome butts of the long guns were held against the cheek. The pistol was a small version of the long gun and, therefore, made in the same shape, only smaller in size. This is shown by the early wheellock pistols made for Emperor Charles V by German gunmakers in both Nuremberg and Augsburg, who sent their products to the Spanish court. Such a variety of strange shapes reveals the obvious state of inventiveness.

The first type of butt which had a shape generally adopted by most of these early gunmakers is exactly the shape of butt of this early Portuguese flintlock pistol. All the other similar butts, which are datable, date:

1531 1533 1537 1540 1545 1546 1547 1548

No later butts of this particular shape are known.

The tiny safety mechanism on the lockplate of this early



Portuguese flintlock (so-called "Anselmo-lock") About 1550-1575. Made in the Goese arsenal. This lock does not have any half-cock position. The earliest known firearm excavated on American soil is a cock of a similar Portuguese flintlock which had been excavated in Florida.

Portuguese flintlock is exactly similar to those on early wheel locks dated:

1531 1533 1537 1540 1548

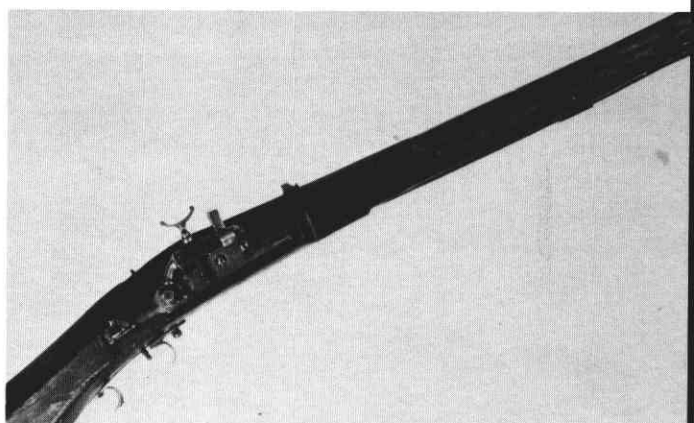
The shape of the barrel, first octagonal, then round, then octagonal again, is typical for exactly the same period. All the other datable parts give the same result. As all individual parts date of the same period, we came to the conclusion that this pistol dates, in fact, between 1530 and 1550.

One huge difference between the early Portuguese flintlock and the early Scandinavian snaphaunce locks, is that this example is very well made and well finished. It shows details of high quality workmanship and proves that the early flintlock makers in Portugal were already well advanced in the art of gunmaking.

This flintlock pistol, which is the earliest one known to date, was not the first one of its kind. This example reveals important and significant refinements, which only a continuous study of this kind of lock would invent. The pan cover spring, for example, being very well made and tempered, has a bow shaped end which presses the pan cover very strongly against the pan. After passing a certain pressure, it allows the pan cover to immediately jump back. This action avoids the loss of sparks. As the result, many more sparks fall into the pan and avoid misfiring. This little detail on this spring, which we find again on all other very early Portuguese flintlock pistols, has the same function as the wheel on the pan cover spring, mainly introduced by English gunmakers in the XVIII century.

Unfortunately, we do not know the name of the maker of this lock. All we do know is that it was made in a Portuguese arsenal between 1530 and 1550 and most probably in Lisbon and by a German gunmaker. There is a tremendous similarity between this flintlock pistol and the early German wheel lock pistols in the Royal Armory in Madrid.

This lock is the earliest version of the well known Portuguese "molinhas" (spring) locks which were made until the late 18th century. They all have a "mecha da caxeta" which is a special type of sear, very similar to the wheellock sear. All are equipped with typical Portuguese hammer cock rest which holds the cock very safely in place. Such a gun may be dropped on the floor and the cock will not go off. This rest, also called a "travao a Portuguesa" (Portuguese)



The earliest known flintlock pistol. Made in the Lisbon Arsenal about 1530-1550. Note the similarity between this pistol and the very early wheellock pistols made for the Emperor Charles Vth in the Royal Armoury in Madrid.

ese brake) was used in Portugal until the early 20th century. It is one of the simplest and best safety systems ever invented. Many of the best guns of the 17th and 18th centuries were equipped with such locks. The important book on gunmaking: "Espingarda Perfeyta," The Perfect Gun, printed in Lisbon in the year 1718 dedicates one chapter and a full page engraving to this type of lock.

This was not the only type of Portuguese flintlock invented in the 16th century. Another type of Portuguese flintlock, possibly still earlier, appeared in the 16th century. This was called the Anselmo lock. As this distinction by this name only shows up in the 17th century, we can not say that this lock was invented by a maker called Anselmo. All we can say, though, is that this name was commonly in use regarding this lock in 17th century Portugal. The invention of it dates back into the very early 16th century.

The similarity between the early "Molinhass" spring lock, (again, a name of the 17th century) and the earliest wheel locks is obvious. Without saying that one comes from the other, we have to consider them as being contemporary and related to each other.

The Anselmo lock, however, seems still earlier as it is very similar to the snap-matchlocks of about the year 1510. The study of this lock is a bit complicated, as there are no known very early examples. The earliest known example is a simple one which is dated somewhere from 1550-1575. This was possibly made in the Goese arsenal. One normally intends to date a simple mechanism earlier than a more sophisticated one, but in this case, the system itself is not only simple, but the workmanship is rather crude and lazy, which makes one conclude that the gun itself was a simple gun, made by an average gunmaker. He merely copied the type of lock already commonly used.

A general feature to be found in all future Anselmo locks was the mainspring outside the lockplate working downwards against the front part of the cock. This system, similar to that of the snap-matchlocks, continued to the 18th century and saw common use in Portugal, Spain and Italy. In Italy, it became known as the "Roman lock."

This early Portuguese example, the earliest known to date, has only one position for the cock. The half-cock

position does not exist, which makes it still more similar to the snap-matchlock. The cock is held to the lockplate by a pin through its axis on the inside of the lockplate. The steel is very thick and the striking surface is changeable. Both the Portuguese Anselmo lock and the Portuguese "Molinhass" lock have combined steel and pancover and are therefore the earliest versions of flintlocks known.

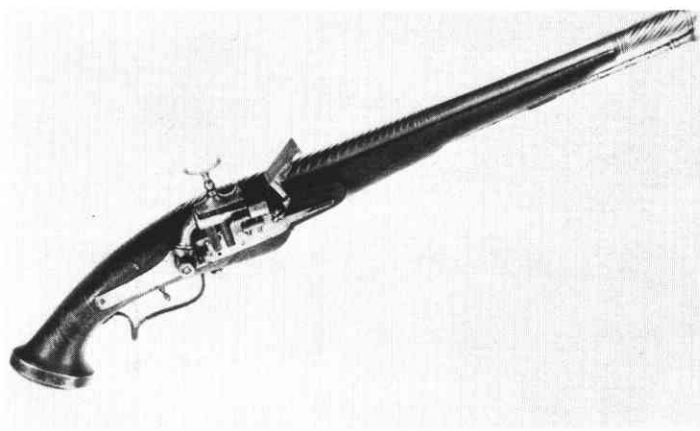
One quite interesting feature is a certain similarity between several details on Portuguese pistols of the late 16th century and some of the very early English and Scottish pistols. The large pin which holds the ball-like trigger, the shape of the muzzle, the three screws to hold the lockplate and other features — are all evidence of such similarity. This influence did not come from England to Portugal. English gunmaking had not yet reached their strength. This influence came from Portugal to England. One interesting fact, generally unknown, is that the famous Spanish Armada which was defeated in battle and storm on the English, Scottish and Irish coasts, was equipped with weapons out of the Lisbon arsenal and most of the ships belonged to the Portuguese-India fleet. So, thousands of Portuguese weapons fell into English hands in 1588. This shows that the gunmaking influence from the European continent to England did not only come through the Huguenots from France, or through the Netherlands, as generally believed. We can see that, to a certain point, some of the early stages of gunmaking came from Portugal.

When Portugal fell into Spanish hands in 1580, a large part of the Lisbon arsenal was taken away by the Duke of Alba. He sent the arsenal to Spain where Spanish forces, including those in the Netherlands, were equipped with Portuguese weapons.

If we speak about Portuguese gunmaking, we do not only speak of guns made by Portuguese or foreigners in Portugal. The Portuguese world of the 16th century had many outposts where guns were needed. The manufacturing of them started in Lisbon, Sagres and Barcarena and spread all over Portugal. A law of the early 16th century ordered every free man to have his own musket ready for use, to be able to defend the Portuguese countries against the foreign invasions. There must have been many hundreds of thousands of muskets and no doubt each little vil-



Portuguese flintlock pistol of the so called "horse neck" type, made about 1610. Note the similarity between this Portuguese pistol and many of the very early pistols made in Great Britain. Similar shape of muzzle, same large detachable pin which holds the trigger in place. Same type of three lock screws.



Portuguese flintlock pistol. Lock and barrel made about 1580. Restocked about 1630.

lage had its own gunmaker, or at least a blacksmith able to repair guns.

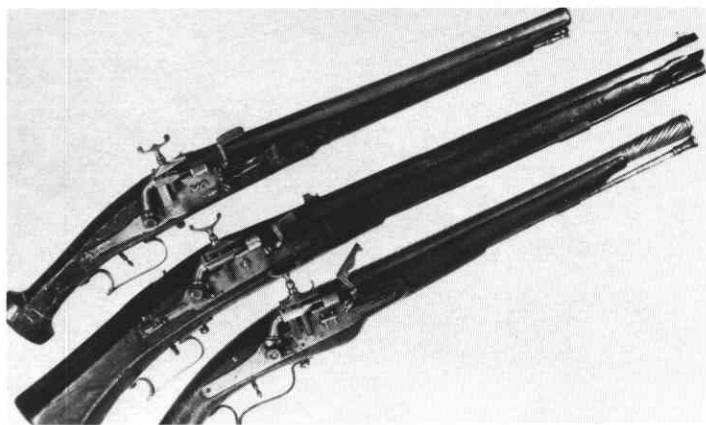
The Portuguese built their own arsenals abroad, where they took many of their best gunmakers. Ceuta, Rio, Luanda, Goa and Colombo were among the biggest arsenals in existence. In addition to the arsenals in Lisbon and Sagres, the Goa arsenal played a special part in Portuguese gunmaking. Goa, a small kingdom in India, was considered as being something special. Goa had the best schools and craftsmen in its hemisphere, and was always envied by its neighbors. Therefore, Goa was continuously at war. The East was divided into hundreds of little kingdoms and the Portuguese could not become friends with one without immediately becoming an enemy of his enemies. Knowing this, Portuguese diplomats first tried to find out who the strongest nations were and against whom they fought. The Portuguese navigators went straight into the harbor without showing any fear. This usually gave quite an impression. The navigators would then call on the Maharaja or Sultan, offering an abundance of gifts, mainly weapons. The Oriental way of thinking ordered that . . . someone who receives a gift must answer with a still greater gift. As a result, the ships were filled with silks and spices, which afterwards in European ports were converted into fortunes. In addition, the Portuguese rented their highly trained soldiers to Oriental sovereigns who in turn paid them large amounts of gold for every little victory. Portuguese soldiers took over India, the same way as the famous Swiss Landsknechts took over all of Europe.

In 1510 Goa fell into Portuguese hands. The Portuguese had already fought against many Turkish and Indian armies, but no fight was greater than the battle for Goa. They lost it some weeks afterwards, but later were victorious again. Goa was equipped with much better weapons than ever found before. Affonso de Albuquerque, the conquerer of Goa, wrote in his letter to King Manuel I on the 22nd of December, 1510, that the quality of cannons and muskets which are being made in Goa is so good, far better than ours from Germany, that he sends several examples of this Goese work to the Lisbon arsenal together with some of their leading masters so that they can work in the Lisbon arsenal for the Portuguese king. In another letter to

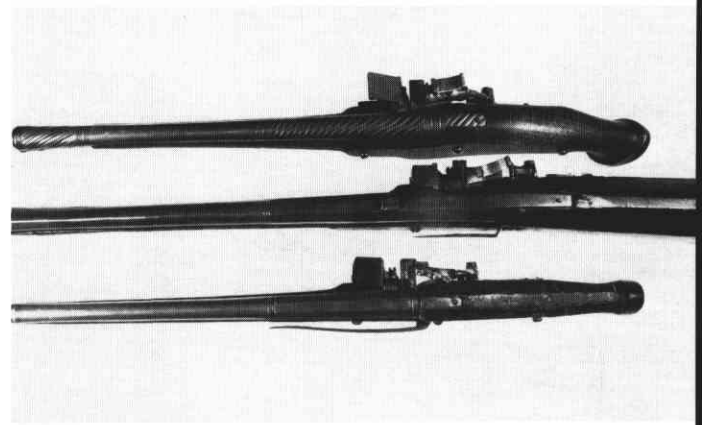
the king, dated 1513, he mentions that the Goese gunmakers equip their barrels with screwed-in breeches like those from Bohemia. These are different from all other Indian guns, in that all other Indian guns usually have a plugged in and welded breech, which is impossible to take out and therefore difficult to clean.

Goa was not only known for its gunmakers, but still more for its goldsmiths and ivory cutters. Very soon, we find hundreds of Indian craftsmen working in Portugal and we find Portuguese working in Goa. This mixture was peaceful and harmonic, as a result of which appears the so-called "Indo-Portuguese Style." In the Metropolitan Museum in New York, as well as in several other places, are 16th and 17th century Indo-Portuguese bed covers of high quality showing Indian interpretation of Portuguese ships and soldiers among Oriental birds. Most items of this style still existing are ivory sculptures of Catholic saint and richly inlaid cabinets and other pieces of furniture. European gunmakers and armourers, together with Indian goldsmiths made unbelievable rich gifts for the Portuguese kings. For example, a complete horse garniture in solid gold with hundreds of diamonds, sapphires and rubies for the King Sebastian. This famous garniture was taken, by the Duke of Alba, in 1580, in Lisbon. It was also taken by the order of Felipe II of Spain, who sent it to Venice where it was sold for an extremely high price. One letter, still in existence, shows that the Portuguese Vice-King of India sent in April, 1588, a gift to the Emperor of Japan. The gift was made in Goa, consisting of two double handed swords, two complete suits of armor, two horse with their saddles and garnitures and two pistols, all richly decorated in gold. Unhappily, none of these items survived. It seems quite possible that these pistols, made in Goa, and richly gold inlaid, were flintlocks. The Portuguese were very fond of their flintlocks and there was no reason why not making a pair of presentation gold inlaid flintlocks for the emperor of Japan.

Until now, only one very rich Indo-Portuguese piece of armor has been found. Its recent discovery, and its high quality, make it proper that this work be mentioned. It is a pear cabacet made about 1560-1570 for the Vice-King of India, Dom Diogo De Meneses. He later offered it to the



Three early Portuguese flintlock pistols. The first about 1610, the second about 1530-1550, the third made about 1580 but later restocked.



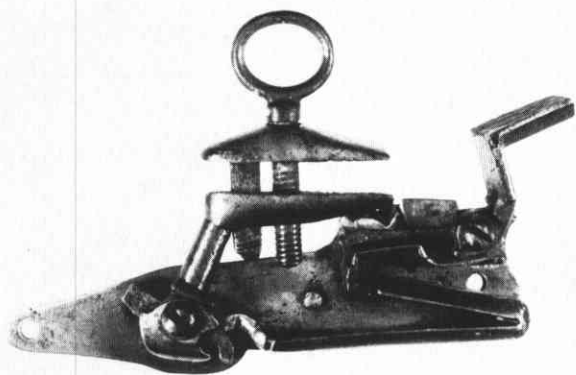
The same three early Portuguese flintlock pistols, seen from above.

King Anthony I of Portugal. King Anthony left it behind on the island of Tereira in the Azores. He had to flee after having lost the naval battle of Saint Michael in 1582 against the Spanish Armada. The cabacet shows Portuguese hunters with their heavy muskets with curved butts, shooting against flying birds. All human figures in the richly chiselled decoration wear large breeches similar to those on early Japanese screens where Portuguese navigators are shown. The over one hundred birds and animals shown on the cabacet are all of typical Goese design. The cabacet, unlike most European cabacets, is made out of copper, richly chiselled and engraved and covered with such uncommon, thick, high-quality fire gilding, that it looks like being made out of solid gold.

The richness of some of these high quality Indo-Portuguese weapons must be one of the reasons they no longer exist. They were probably mostly taken apart or re-cast.

Even so, we find many manuscripts of the 16th and 17th centuries which speak about interesting firearms from Goa. Many of them were multi-shot revolving guns equipped with "Patilha," nowadays so called "Miquelet," locks. A fine hunting gun of King John IV of Portugal, made about 1650 in Lisbon, shows the Indo-Portuguese influence in its decoration inlaid in ivory, mother-of-pearl, and tortoise shell. A four-chambered revolving gun of about 1660 is of Goese origin with typical Indo-Portuguese influence.

The Portuguese also had good quality foreign and local gunmakers working for them in Colombo, Ceylon. The Ceylon guns, however, are different from the Indo-Portuguese ones; usually they are recognizable through their very tiny flamed and curved leaf shape decoration. An interesting ivory butted and richly decorated wheellock pistol in the Hermitage, which was a puzzle to most students, belongs to this Ceylon group of the 16th century. Another of this group is a very large and finely chiselled and inlaid matchlock musket, with Portuguese-Singhalese matchlock, in the Royal Armory in Madrid. This item carries the Portuguese coat of arms on the barrel. A later Anselmo lock gun in the Leiden Museum is of the 1650 period and interesting as it is signed: "D. Trely A Colombo." Another, but early 17th century gun, is in the



Portuguese Anselmo-lock of the 17th century.

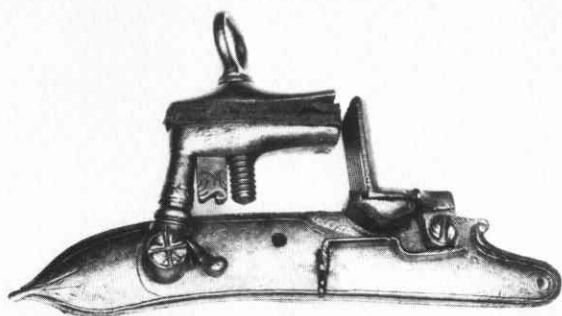
Metropolitan Museum. This bears a left-sided Anselmo lock of typical Singhalese-Portuguese origin. This gun has a curved "V" shaped butt similar to another much earlier one known, which had been converted from a 1550 period matchlock to a 1630 period Anselmo flintlock of Singhalese-Portuguese design.

Portuguese firearms got spread around the world very quickly. They even saw use in Northern America. Portuguese navigators, like Corte Real for example, checked all the east coast of both Americas to find a way through to India. It was Magellan who discovered a passage and whose ships were the very first to sail around the whole world. Most of these early navigators must have been equipped with good quality Portuguese firearms.

It is curious to know that the earliest firearm fragment known to have been excavated in America is a cock of a Portuguese Anselmo-lock flintlock pistol which dates into the third quarter of the XVIth century. It was excavated in Florida and belongs now to the St. Augustine Historical Society.

Another early Portuguese flintlock mechanism had been excavated at Jamestown and belongs now to the National Park Service. This lock is of the Molinhas lock family and dates into the very early 17th century. Unluckily both locks had been misdescribed as being Miquelet locks and of Spanish origin. A third lock has been excavated in Massachusetts; they all show the existence of early Portuguese firearms in North America.

In South America the quantities of early Portuguese firearms in use must have been much larger. Brazil, which by itself represents almost half of the South American continent, belonged to Portugal until the 19th century. The Royal Portuguese Arsenals in Rio, Bahia and Pernambuco



Two Portuguese versions of the "molinhas" or spring-lock, both made in the 17th century.

were filled with Portuguese guns and employed quite a large number of Portuguese gunmakers. Unhappily only late 18th and early 19th century examples of their work survived.

Wherever the Portuguese went in the 16th and 17th century, they took their flintlocks with them. Surely more will be found. This study merely points out their existence, hitherto unknown. The student of historical arms, may, as a result of this study, have some light shed upon the fascinating ignition system in use in the Portuguese speaking world for almost 400 years.

We can see how a small and unimportant nation can write history just for owning sophisticated and superior weapons. We can see too, that such weapons can exist in

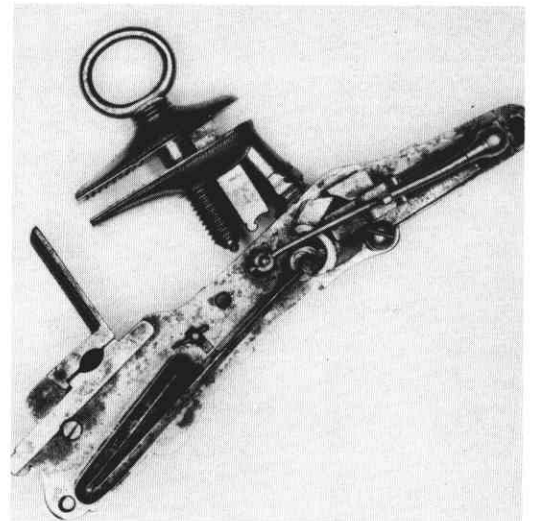
the hand of mankind, without imposing automatic population extermination. The simple knowledge of existence of these superior weapons usually was reason enough for not being attacked by potentially much larger countries.

As a humble student of the history of firearms I pay my veneration to these generations of unknown early flintlock gunmakers who helped to build up the Portuguese speaking part of the world, which lived for 500 years and only recently was condemned to the cruel destiny of modern slavery.

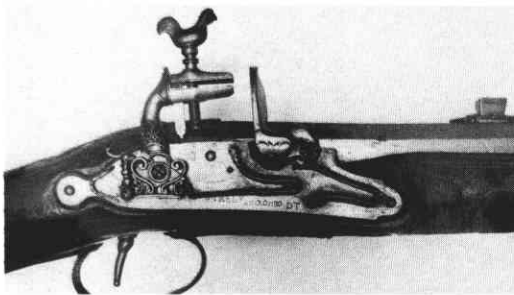
(Note: Mr. Daenhardt's trip was, in part, made possible by a grant from the Arizona Historical Society.)



Portuguese "molinhas" or spring-lock made in the 18th century.



Internal view of the 18th century Portuguese "molinhas" or spring-lock. Note the horizontal working sear.



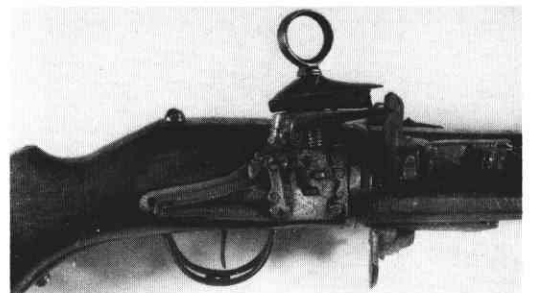
Singhalese-Portuguese flintlock gun in the Leiden Museum. Made in COLOMBO, Ceylon about 1650.



Indo-Portuguese four chambered "patilha" or so-called miquelet-lock gun made in the Goese arsenal about 1660.



Indo-Portuguese fowling piece made in Lisbon about 1660 with typical Indo-Portuguese inlay in mother of pearl, tortoise and ivory.



Indo-Portuguese three-barrelled superimposed flintlock revolving carbine with so-called "patilha" or miquelet-lock. 17th century.