

# What Can be Learned from the Landeszeughaus Wheellock Collection in Graz, Austria

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This collection offers a unique opportunity for scholars: 200 years of purchases during 16<sup>th</sup> and 17<sup>th</sup> centuries, much of which remains unique in Europe as other arsenals sold their weapons when they became obsolete or when they needed the space for other uses. What survives today is:

- Geneva—only a small remnant
- Dresden—princely weapons including Elector guards
- Solothurn—some armors and a few weapons

As a consequence, one can trace the development of the wheellock mechanism at the Landeszeughaus, especially during the first half of the 16<sup>th</sup> century where there are twenty examples plus one detached lock.

The scholar is also blessed with the existence of reasonable primary sources, (especially archival), several studies of the Steiermark (Styria) and Kärnten (Carinthia) arms-making towns, and a very good archival study of the early Nürnberg firearms industry.

The earliest European hand-carried firearms, which evolved during the 14<sup>th</sup> and 15<sup>th</sup> centuries, used a lighted match or wick for ignition. By the 16<sup>th</sup> century, matchlock long gun firearms became relatively cheap and were easy to use. However, this mechanism had several disadvantages vis a vis the requirements in Steiermark for dealing with marauding enemy troops:

- Required preparation time to light the match wick;
- Unreliable in the rain;
- Cavalry had to dismount in order to use effectively.

Thus, a self-igniting firearm which could be kept cocked and ready to use was important for Steiermark border military operations, which involved:

- Small unit troop actions against marauding Hungarians or Turks;
- A small standing Steiermark professional infantry/cavalry, except during a major invasion when a levy of green troops would be called up and armed with matchlock muskets;
- A network of border fortresses.

Given these circumstances, the military need was for self-igniting firearms to be used by 2,000 to 4,000 professional soldiers, and thus we find a large number of costly



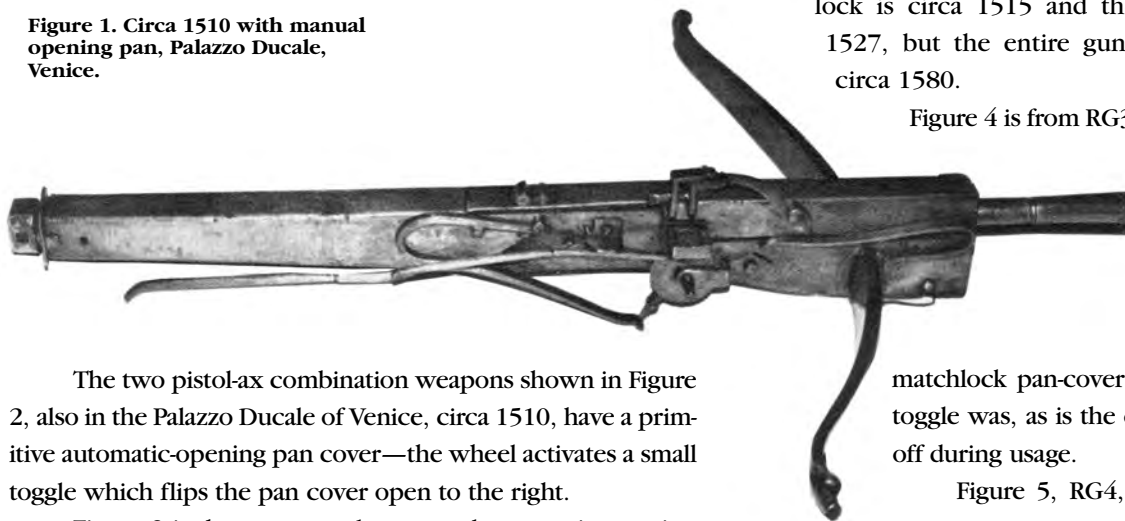
wheellock firearms. Elsewhere in Europe, the infantry carried matchlock weapons. Cavalry alone were issued self-igniting wheellocks starting circa 1560.

The first wheellock firearms were probably made in two towns in the Veneto, in Friuli, close to the Habsburg borders, around 1500. A Venetian captain, Da Porto, recounts an encounter during 1509-10 where a cavalry unit that he commanded was able to approach an Imperial cavalry unit. Seeing no lighted matches, the cavalry unit assumed the attack would be with swords. When fired upon at close range by self-igniting guns, they were completely surprised and thrown into confusion. Da Porto also mentions people in Friuli, which he observed in 1610, using wheellocks to shoot at flying birds—suggesting guns with automatically opening ignition pans.<sup>1</sup>

The Habsburg frontier bordered on Friuli and much of the Italian commerce passed through it coming from northern Italy or Venice heading to Vienna and then on to Germany. Conditions were right for the rapid dissemination northward of the invention of the wheellock. As the southern Austrian province of Steiermark with its capital of Graz was adjacent to Friuli and on this trade route, it is not surprising that the wheellock arrived there during the early 16<sup>th</sup> century.

Figure 1 is a pistol-crossbow combination weapon located in the Palazzo Ducale of Venice, circa 1510, with a manual priming pan, the same pan type as found in matchlock firearms. The three examples of this crossbow-pistol in Venice are the earliest surviving examples of wheellock firearms.

Figure 1. Circa 1510 with manual opening pan, Palazzo Ducale, Venice.



The two pistol-ax combination weapons shown in Figure 2, also in the Palazzo Ducale of Venice, circa 1510, have a primitive automatic-opening pan cover—the wheel activates a small toggle which flips the pan cover open to the right.

Figure 3 is the same toggle-actuated automatic-opening pan mechanism, as seen on Figure 2, except that it is on a Steiermark-made long gun, RG2, in the Landeszeughaus. The

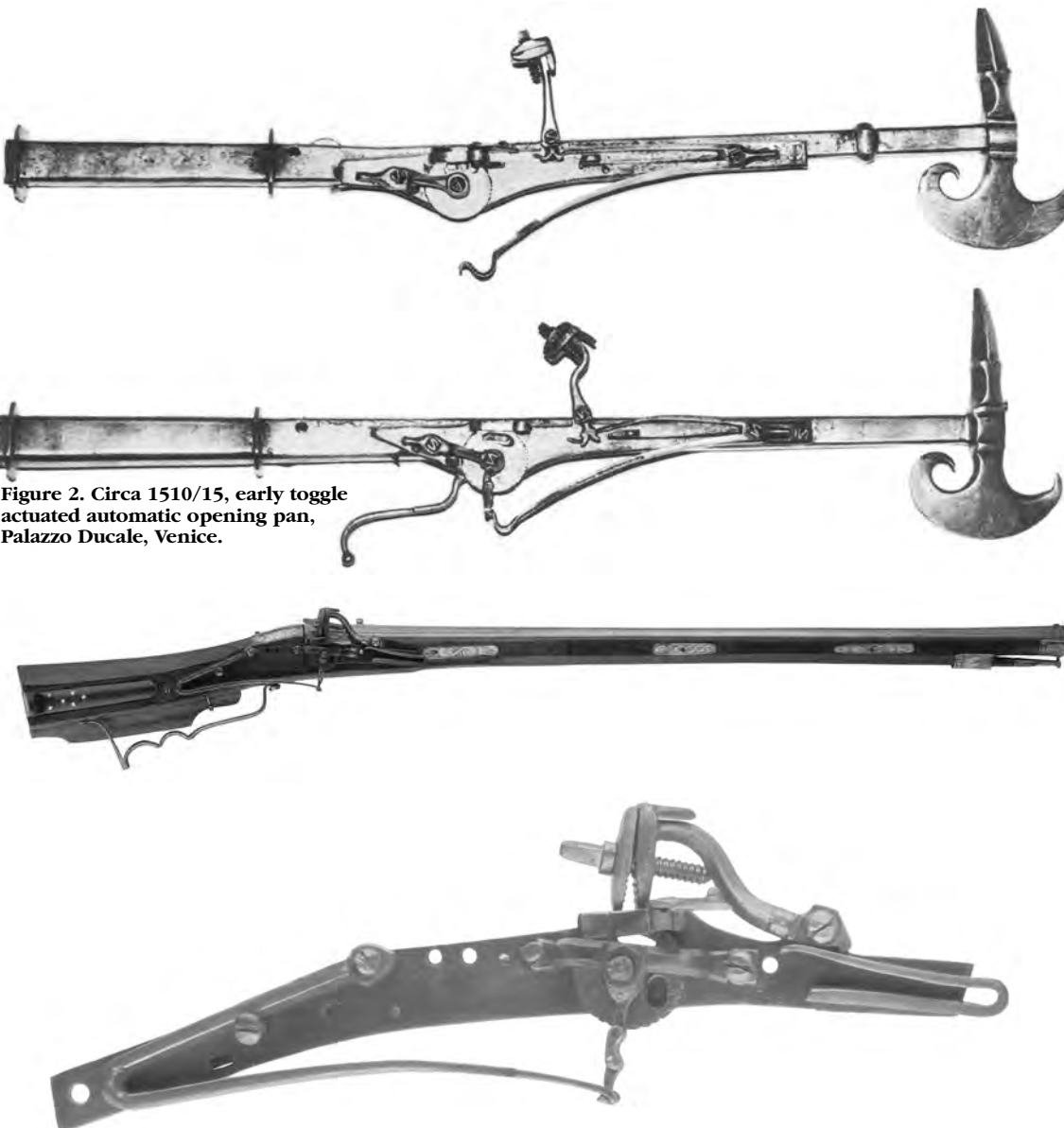


Figure 2. Circa 1510/15, early toggle actuated automatic opening pan, Palazzo Ducale, Venice.

Figure 3. RG2 with toggle actuated automatic pan, Landeszeughaus, Graz.

lock is circa 1515 and the Nürnberg barrel is dated 1527, but the entire gun was rebuilt and restocked circa 1580.

Figure 4 is from RG3, also in the Landeszeughaus, and shows the details of this type of lock, including the toggle and the open pan cover. This design is no more than that of the rotate-to-the-right matchlock pan-cover design. The thin and fragile toggle was, as is the case with RG2 and 3, broken off during usage.

Figure 5, RG4, shows the evolution of the pan cover to a more sturdy design where the cover is pushed forward along the barrel by an inner lock lever, circa the 1520s.

Figure 6, RG5, are the next minor improvement in this evolution of Steiermark-made guns, probably circa 1525, from RG4.

Figure 7, RG8, Steiermark, circa 1530, is the next step in this evolution of the wheel-lock mechanism. All of these guns have been rebuilt during their working lives.

Figure 8 is a wall gun, FRG285, which has a lock from the 1540s, but reflects two rebuildings, the latest being about 1680 to 1690.

Around the iron mines at Erzberg in the center of Steiermark, an important metalworking industry developed during the late 15<sup>th</sup> century. The Pögl firm in nearby Thörl was the major supplier of canons and long guns with initial deliveries in 1468. From 1500 to 1506, this firm supplied 1,450 iron canons and 9,950 long guns.

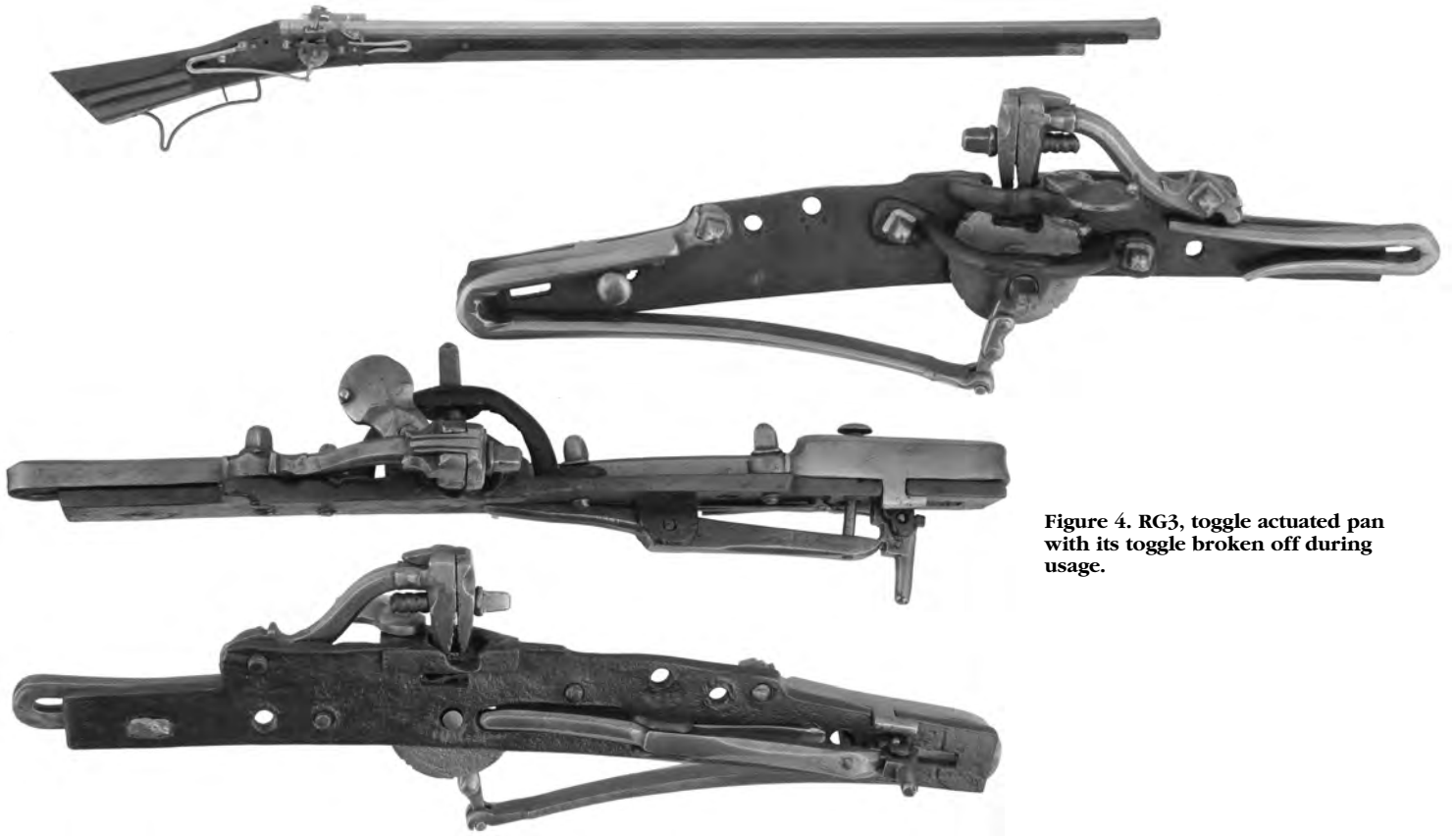


Figure 4. RG3, toggle actuated pan with its toggle broken off during usage.

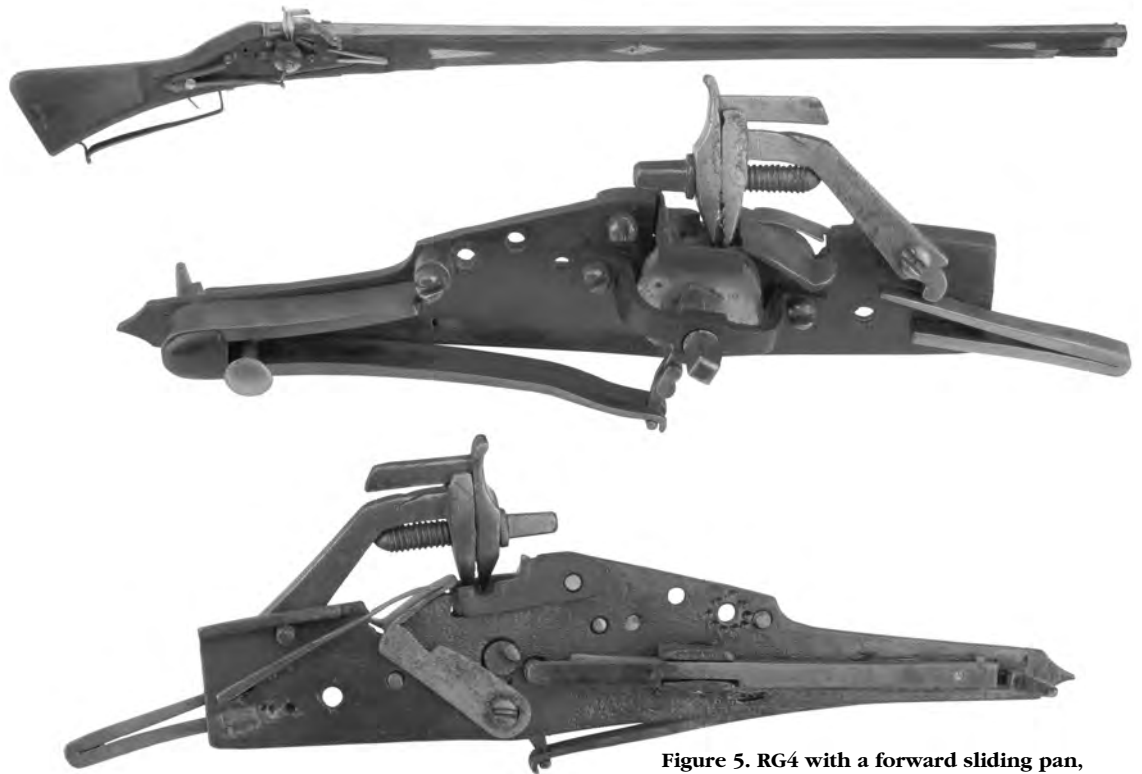


Figure 5. RG4 with a forward sliding pan, 1520s, Landeszeughaus, Graz.

The evolution of the pan cover to a more sturdy design where the cover is pushed forward along the barrel by an inner lock lever. The Pögl firm most likely supplied the above early wheellock firearms seen in Figures 3-8.

After the Hungarian defeat by the Turks at Mohács in 1526, Ottoman pressure increased as the Turks moved northwest, laying siege to Vienna in 1529. By the 1560s, it was clear that local production of firearms would be inadequate to meet



Figure 6. RG5, circa 1525/30 Landeszeughaus, Graz.

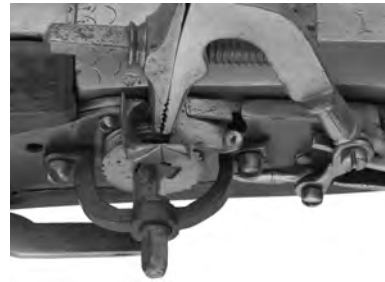


Figure 7. RG8, circa 1525/30 evolutionary improvement, Landeszeughaus, Graz.



Figure 8. FRG285, wall gun with lock from the 1540s, last rebuilt circa 1680/90, Landeszeughaus, Graz.

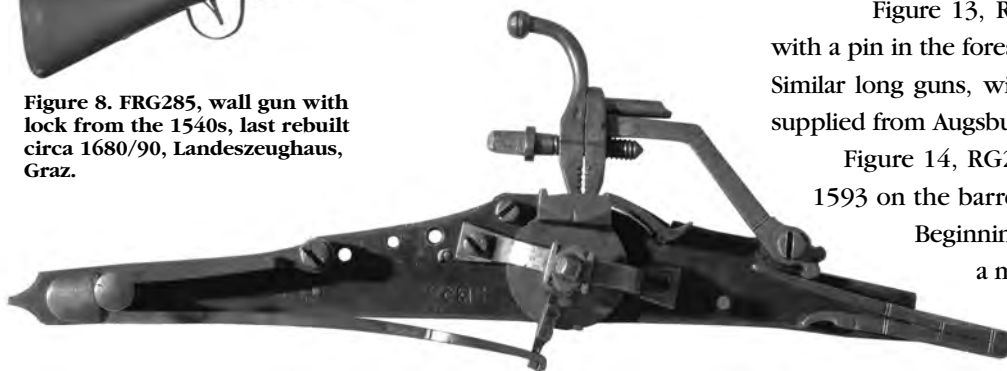


Figure 12, RG75, is a long gun made in Nürnberg, which is dated 1594. It is reflective of arms supplied from Germany.

Figure 13, RG72, Steiermark, dated 1581 was made with a pin in the forestock for use on a stand or on a wall rest. Similar long guns, with or without such rest pins, were also supplied from Augsburg.

Figure 14, RG248, is also from Nürnberg and is dated 1593 on the barrel.

Beginning in 1580-90, long guns started to follow a more or less standard design although barrel lengths and calibers tended to vary with each gun. This standardization can be seen in the lightly decorated RG586, circa 1600, made in Steiermark (Figure 15).

Figure 16, RG607, circa 1610/20, was also made in Steiermark.

By the 1620s, newly acquired wheellock long guns started to be made with only a wheellock ignition system, as seen in Figure 17, RG667, which is dated 1617 and is rifled. Marksmen with rifled guns became part of the Steiermark infantry starting in 1556. This design, rifled or smoothbore, continued until circa 1650/60 when the wheellock was replaced by the cheaper and easier to use French style flintlock long guns.

Many of the wheellock long guns and wall guns in the Landeszeughaus have been rebuilt. Figure 18, RG139, is a typical example, rebuilt circa 1620/30, with a refurbished older lock and barrel.

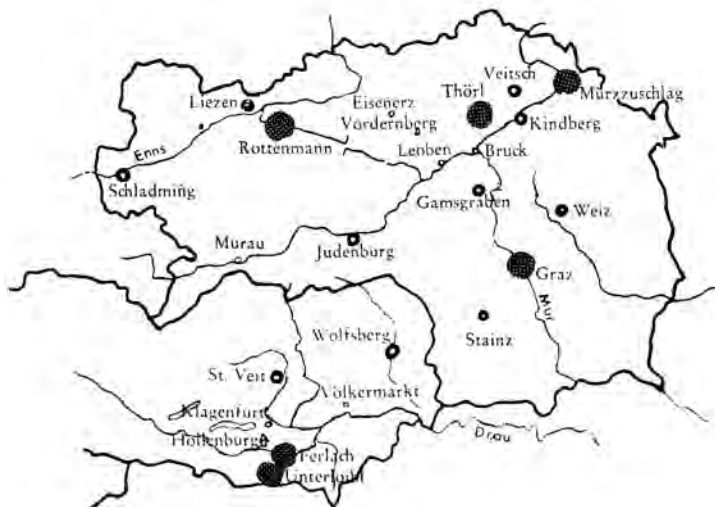


Figure 9. Map of Steiermark and, to the lower left, Kärnten, showing the gun making centers.

the Turkish threat. As a consequence, large Steiermark orders were placed with Nürnberg and Augsburg. German states and imperial free cities provided funds to Steiermark for the purchase of armaments, called the Reichshilf, in the expectation that the

Turks had to be stopped in Austria before they invaded Germany.

### WHEELLOCK LONG GUNS

Figure 10, RG9, reflects a typical Steiermark-made gun, circa 1550/60. It has a Germanic style stock, dual matchlock-wheellock ignitions, smoothbore, but with only modest decoration.



Figure 10. RG9, Steiermark, circa 1550/60, Landeszeughaus, Graz.



Figure 11. RG11, circa 1570/80, is a locally made carbine.



Figure 12. RG75, Nürnberg, dated 1594.



Figure 13. RG72, Steiermark, showing pin in forestock for stand or wall rest, dated 1581, both in the Landeszeughaus, Graz.



Figure 14. RG248, Nürnberg, dated 1593 Landeszeughaus, Graz.

Figure 15. RG586, Steiermark, circa 1600 showing initial standardization of long guns, Landeszeughaus, Graz.



Figure 16. RG607, Landeszeughaus, Graz.

Figure 17. RG667, rifle, an example of the last type of standardized long gun, dated 1617, Landeszeughaus.



Figure 18. RG139, an example of a rebuilt long gun, Landeszeughaus, Graz.

## PISTOLS FOR MOUNTED TROOPS

The large numbers of surviving wheellock pistols in the Landeszeughaus suggest that about one-third of the proposed army of 4,000 to 6,000 were mounted. Such a high ratio is unique to fighting border incursions by roving bands of Turks or Hungarians. The normal ratio for France, for example, is not three to one as it was in Steiermark, but 10 to 20 infantrymen for every cavalier.

From the 1560s to the early 1600s, Steiermark acquired whatever pistols were available with little standardization. Pistols were made up in matched pairs until circa 1620/30. During the 16<sup>th</sup> century, pistols tended to be decorated. They were likely enriched with decoration to reflect the rank of the commanding colonel who may in fact have acquired them for their units. However, by circa 1620/40, the design for military pistols acquired by Steiermark started to become standardized. Both trends occurred simultaneously in all German-speaking lands as well as the rest of Europe.

Figure 19, RP254, dated 1566, is the earliest pistol in the Landeszeughaus collection, reflecting a growing cavalry use of pistols throughout Europe by the second half of the 16<sup>th</sup> century. Figure 19 was

probably made in Nürnberg and reflects the style for pistols from about 1540 to the 1560s.

By the 1560s, the fishtail butt design was generally replaced by a round ball butt and such a pistol was called a Puffer. Figure 20, RP245, is one of a series from Augsburg. As you can see, the decoration is elaborate.

Figure 21, RP104, is of an Imperial Austrian design of which the Landeszeughaus has 57 examples. Perhaps another 500 or so examples exist in other collections. The author has one of these in his collection.

Figure 22, RP95, is from the same Imperial Austrian series. Note the differences in the decoration from the pistol in the previous Figure 21.

By circa 1610/15, pistols started to become elongated with less decoration, following the general European fashion driven by French tastes (Figure 23, RP281). In the next 5–10 years, pistols became longer and lighter, as can be seen in Figure 24, RP174. These pistols in the Landeszeughaus were produced in both Augsburg and Nürnberg.



Figure 19. RP254, Nürnberg 1566 Landeszeughaus, Graz.

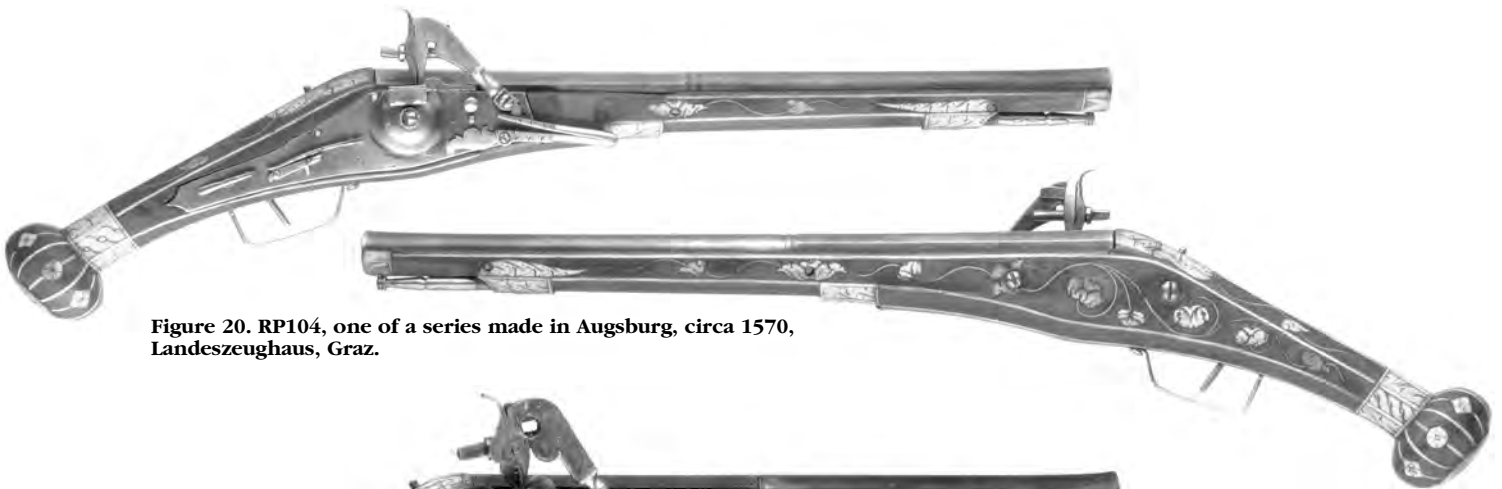


Figure 20. RP104, one of a series made in Augsburg, circa 1570, Landeszeughaus, Graz.

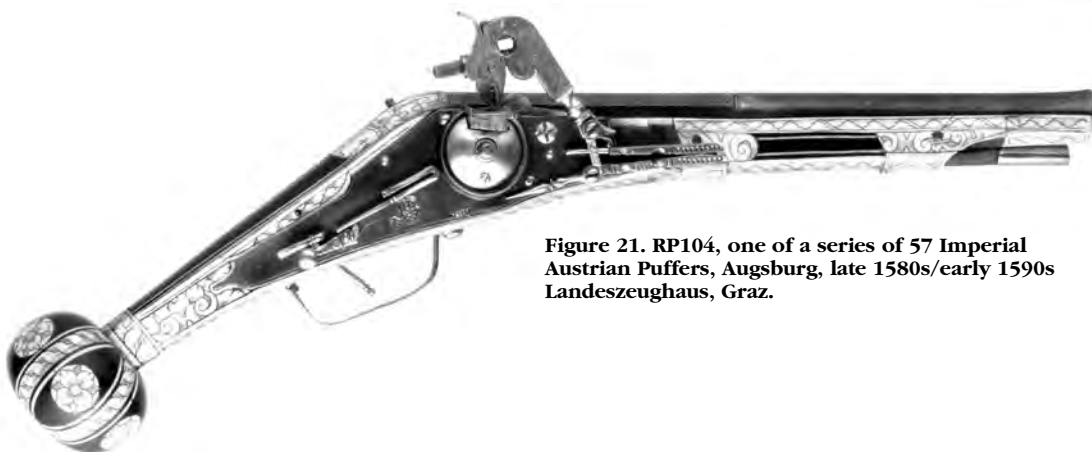


Figure 21. RP104, one of a series of 57 Imperial Austrian Puffers, Augsburg, late 1580s/early 1590s Landeszeughaus, Graz.



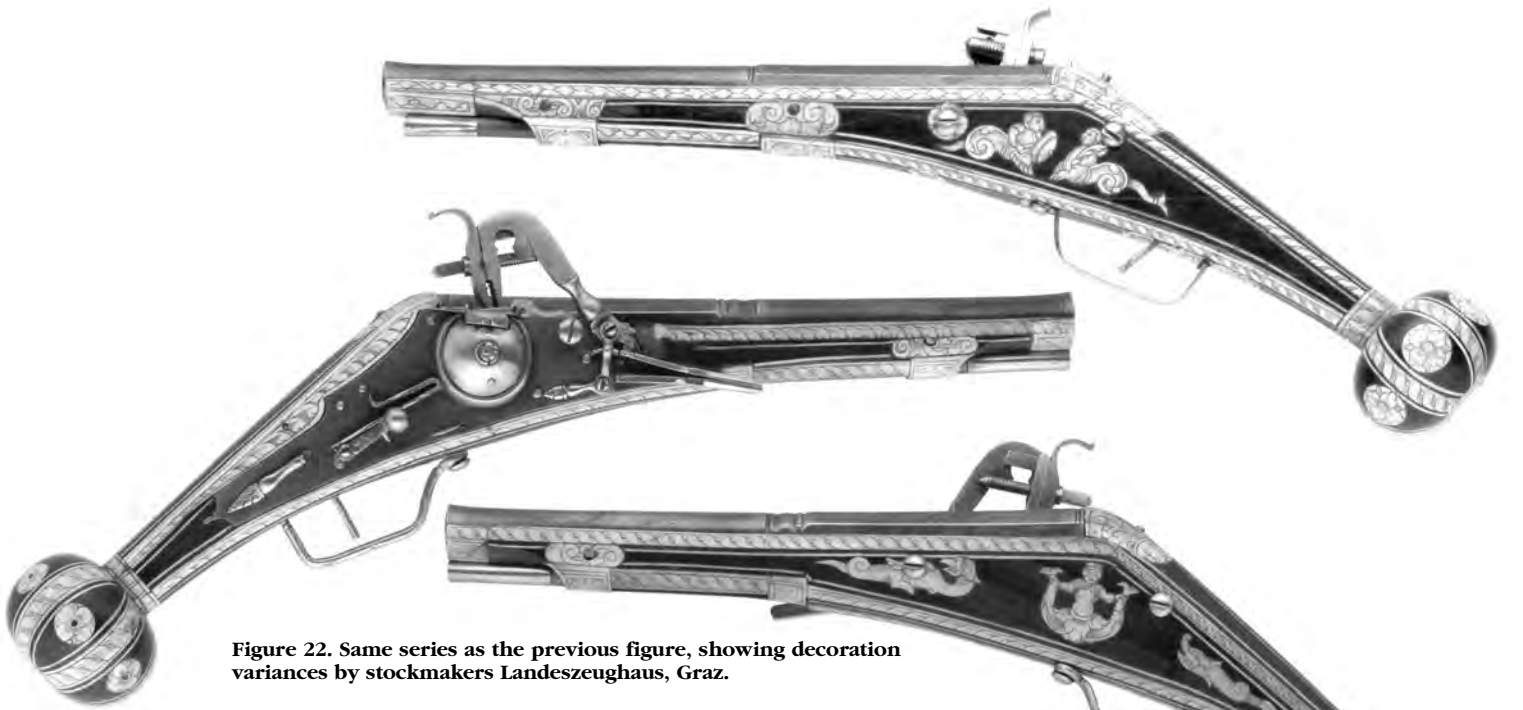


Figure 22. Same series as the previous figure, showing decoration variances by stockmakers Landeszeughaus, Graz.



Figure 23. RP281, circa 1610/15 Landeszeughaus, Graz.



Figure 24. RP174, Nürnberg, circa 1620/25 Landeszeughaus, Graz.

Figure 25, RP552, circa 1620/25 is heavier and was probably made in either Steiermark or Ferlach, following the Italian style. The Landeszeughaus has 22 examples of this pistol.

Figure 26, RP575, is an early purchase from Ferlach, circa 1620/30, following the Italian style. Made in circa 1620/30 it carries the arms of a prominent

Steiermark family, in this case Hans Franz von Stainach, whose lands were near Liezen in the center of Steiermark.

In approximately 1620/30, Steiermark began to acquire a standardized design made in Nürnberg (Figure 27, RP304). The Landeszeughaus has 127 examples as well as

Figure 25. RP552, Steiermark or Ferlach, one of a series, Landeszeughaus, Graz.



Figure 26. RP575, Ferlach circa 1620/30, Italian style, one of a series made for the von Stainach family of Steiermark Landeszeughaus, Graz.



additional later models (circa 1630/40) made at Suhl and then around 1640 made at Ferlach. Guns made after the 1640s have no decoration at all.

Figure 28 (RP591) is one of a series of Italian-style examples acquired from Ferlach around 1630/40. The barrel is stamped with the proofmark of the owner of the Ferlach manufactory, the Count of Dietrichstein. The author has one of these in his collection.

By about 1640/50 a very large number of pistols were acquired at the end of the Thirty Year War from Ferlach (Figure 29, RP713) following a common Dutch and German design. These often bear the Dietrichstein barrel proof for the owner of the Ferlach works. Often the barrel tang has a

V carved in the stock around it, a feature unique to Ferlach. This type was also made at Suhl and later at Wiener Neustadt, the Imperial Austrian manufacturer.

In about 1650/60, a very large number of pistols (like the one in Figure 30, RP1904) were acquired from Ferlach. The Landeszeughaus has 1,715 examples. The author also has one of these in his collection.

Fancier, more costly versions were also acquired, probably for sergeants or officers, as can be seen in Figure 31, RP2490.

In 1650-1670, the 238 Ferlach pistols like that in Figure 32, RP1894, were purchased from Ferlach, again following a general Dutch or Suhl design.



Figure 27. RP304, an early attempt to standardize pistols, Nürnberg, circa 1620/30 Landeszeughaus, Graz.

Figure 28. RP591, one of a series made at Ferlach, 1630/40, Landeszeughaus, Graz.



Figure 29. RP713, one of a series made at Ferlach, 1640/50, Landeszeughaus, Graz.

Figure 30. One of a large series ordered on Ferlach in 1649/50, Landeszeughaus, Graz.

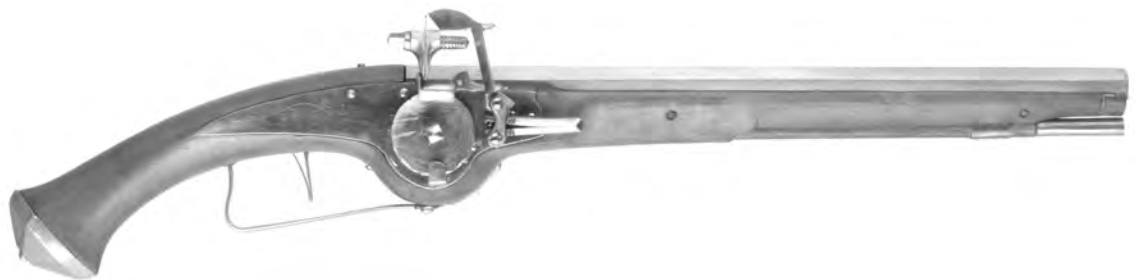


Figure 31. RP2490, fancier version of standard model in Figure 30, probably made for sergeants or officers, Landeszeughaus, Graz.



The Landeszeughaus also contains 20 pistols of the standard Imperial Austrian design, as seen in Figure 33, RP1111, acquired from Suhl or Wiener Neustadt. The author owns one in this series.

Figure 34, RP1907 is an example of the last wheellock pistol model, circa 1680/90, using a design developed for flintlock pistols. French-style flintlock pistols had been acquired by Steiermark during the 1650s/60s. The flintlock was cheaper as well as easier to use than its wheellock predecessor—including faster to reload. Apparently, some cavalry commanders still preferred the older wheellock design over the flintlock for the next 40 to 50 years, a phenomenon which also occurred in Scandinavia and in some other German states.

These Landeszeughaus pistols were mainly made at Ferlach with a few coming from Suhl.

Figure 35, SP333 is an example of the contemporary flintlock pistol, circa 1690, used by Steiermark, also supplied by Ferlach.

Figure 36, SP9, circa 1670, is a Ferlach supplied flintlock pistol. The form is essentially that of a wheellock pistol.

I have covered a collection of approximately 4,000 wheellock firearms. For a more detailed discussion, you may

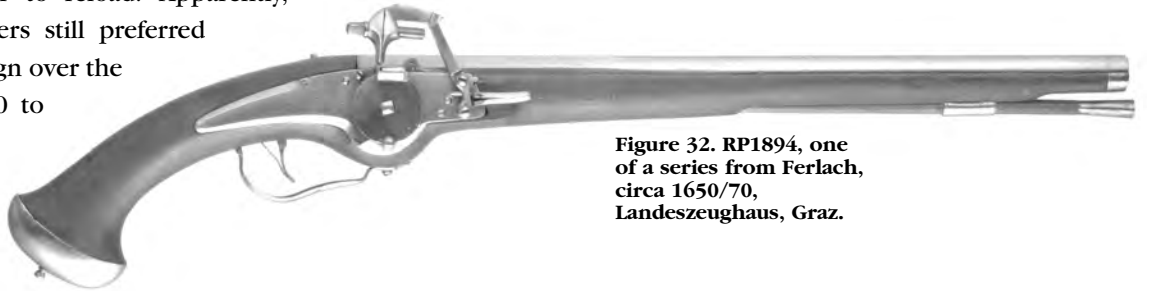


Figure 32. RP1894, one of a series from Ferlach, circa 1650/70, Landeszeughaus, Graz.

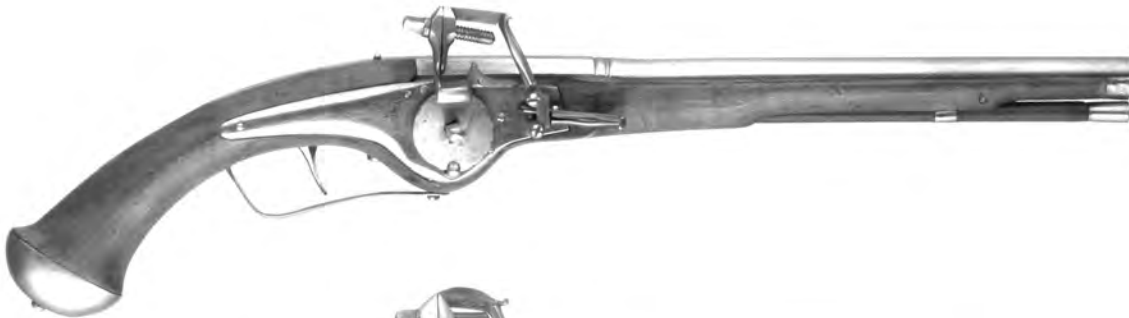


Figure 33. RP1111, one of a series of an Imperial Austrian model, circa 1670/80 Landeszeughaus, Graz.

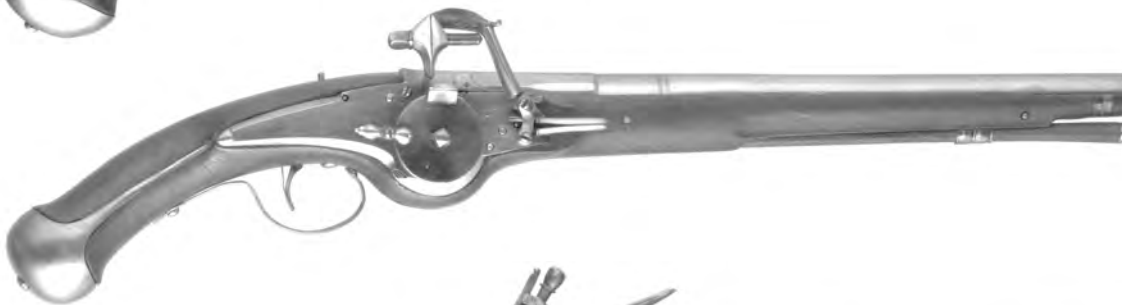


Figure 34. RP1907, last of the wheellock military pistol purchases, circa 1680/90, Landeszeughaus, Graz.

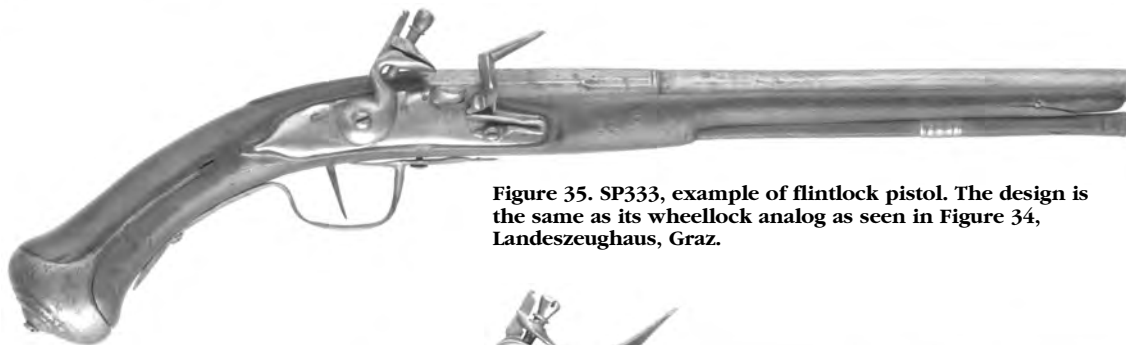


Figure 35. SP333, example of flintlock pistol. The design is the same as its wheellock analog as seen in Figure 34, Landeszeughaus, Graz.

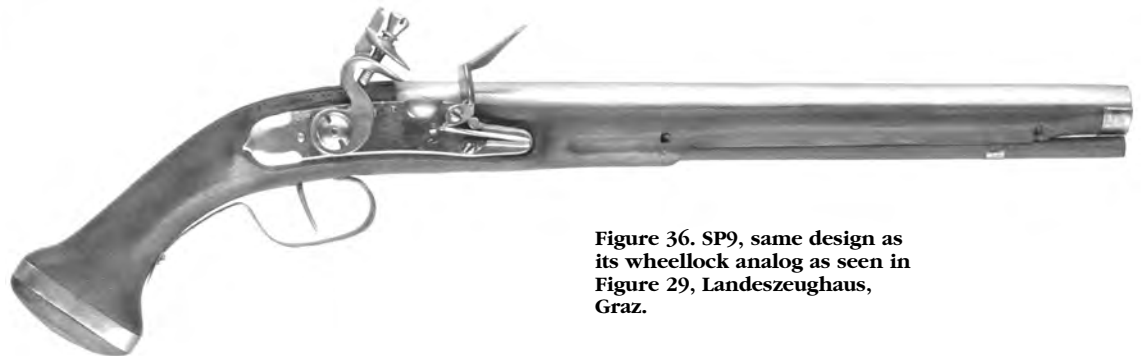


Figure 36. SP9, same design as its wheellock analog as seen in Figure 29, Landeszeughaus, Graz.

want to refer to the new 730 page wheellock catalog with over 2,400 color photographs of this collection which is available from the Landeszeughaus (Landeszeughaus, Herrengasse 16, 8010 GRAZ, Austria for 65 Euros plus 20 Euros postage, major credit cards accepted).

This article was originally prepared as a talk for the GHWK meeting in Graz, September, 2006. The German version which I have prepared will appear in the GHWK's 2007 ZHWK.

#### FOOTNOTE

1. C. Blair, "A Note on the Early History of the Wheellock," in *JAAS*, March 1961, pp 221-256. Also, by the same author with new information, "Further Notes on the Origin of the Wheellock," in R. Held, ed., in *Arms and Armour Annual*, Illinois, 1979, and "Nuovi documenti sulla storia dell'arme di ruota primitive in Italia," in *Armi Antiche 1996*, Torino, 1999.