# A Forgotten Giant: A Brief Look at Military Small Arms Production at Steyr, Austria, 1864–1945

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## STEYR: A FORGOTTEN GIANT

## SECTION I: 1864–1900

The 19th century saw a transition in the western world from small shop and cottage-industry manufacturing to the modern factory system. This industrial transition affected virtually every field of manufacturing, including the field of weapons production. In addition, the 19th century saw the development of major armament corporations, which could not only supply the weapons of war to their native countries, but could also supply to other European nations and to nations around the world.

When the arms aficionado thinks about such worldwide arms corporations, names like the English firm, BSA or Birmingham Small Arms, Fabrique National from Belgium, Waffenfabrik Mauser from Germany, or U.S. firms like Colt, Remington, and Winchester immediately come to mind. The production of these firms is, to say the least, legendary. However, all too often the student of modern military arms forgets one of the most prolific and versatile arms companies of the last 125 years, Österreichische Waffen Gesellshaft, more commonly known by the city where it was and is located, Steyr, Austria, because, in the last half of the 19th century, Steyr was one of the world's giants in military small arms manufacturing. This article was designed to give a basic overview of the development of this plant and its military production.

The city of Steyr is a relatively small community situated in eastern Austria on the Steyr River, at its confluence with the Enns River. While the specific firm covered in this article has only been in existence since the period of the American Civil War, iron-working was a tradition in Steyr as early as the 13th century. Records indicate small arms manufacturing also has a long history in this community since as early as 1595, when local craftsmen were manufacturing small arms. By the late 17th to early 18th centuries, small arms manufacturing, particularly military small arms, had become a significant occupation for the burgers at Steyr.[1]

The origins of the modern manufacturing conglomerate Steyr, however, are rather recent and are directly associated with the Werndl family. Although, as early as 1640, shops in Steyr produced small arms for the Emperor of Austria, it was

the Werndl family that really put Steyr on the map for arms manufacturing, first in Austria and later throughout Europe. The origins of this famous plant can be traced directly to one of Steyr's citizens, Leopold Werndl. In 1821, Leopold Werndl established himself as one of a number of arms manufacturers in the city, producing infantry rifles, rifle barrels, stocks, lance points, bayonets, and various other arms components. His factory grew and ultimately employed 450 workers. Through his efforts, the company expanded in terms of both production and facilities. It had become a major area producer by the time of his death in 1855.[2]

Leopold Werndl had 16 children but of this number the most talented and the one who would ultimately succeed him as head of a successful company was his second son, Josef.[3] After Josef studied 6 years in Normalschule in Steyr, the elder Werndl sent his son to Vienna to study under Ferdinand Frühwirth (1844–1847), one of the best Austrian gunsmiths. In Vienna, the younger Werndl became intrigued with modern manufacturing techniques, particularly, powered machinery. His attitude was in contrast to his father's, who regarded machines as the "enemy of mankind."[4]

His education on small arms manufacturing was furthered when he volunteered to serve with a Chervaux–Leger Regiment and was subsequently posted to the old State Rifle factory in Wein-Wahring.[5] At this facility, he became acquainted with an American technician who was working there, named John Pall. He had long conversations with Pall regarding machine technology and Werndl subsequently undertook a

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series of study trips to Suhl, Sommerda, St. Entienne, Liege, and finally, the United States. While in the United States (1852–1853), he worked as a laborer in both the Remington plant in Ilion, New York, and the Samuel Colt's factory in Hartford, Connecticut. During his work/study trip in the United States, Werndl paid particular attention to the concept of interchangeable parts and the use of machines, rather than craftsmen's labor, to produce stocks and firearms components.[6] Interchangeable parts were not the norm in Austria at that time. As anyone who has ever worked with Civil War vintage Lorenz rifles can attest, the Austrian Arms industry had not truly converted to interchangeable or machine-oriented production of weapons.

During his travels and studies, Werndl was intrigued by the possibility that firms could quickly produce, with modern machinery, quality weapons at reasonable prices. In particular, while in the United States, he studied the potential of steam power for machinery to manufacture the metal components and stocks for weapons. Enthused after he returned from his first American study tour, he bought a polishing and grinding firm and began to acquire machinery to set up an arms plant. While he was in the process of preparing to launch his firm, his father, Leopold, died (1855). With the death of the elder Werndl, his widow placed the family business in the hands of Joseph and his brother, Franz.

As head of the family business, Joseph continued to be intrigued with the possibilities offered by modern manufacturing techniques and particularly with concepts he had observed in the United States. Due to his continued interest in modern manufacturing techniques, in 1863 he again traveled to the U.S. in a trip that should be described as a research and buying trip. This trip was scheduled despite the fact that the United States was in the midst of a bitter and bloody civil war.

On this trip, he was accompanied by his business manager, Karl Holub.[7] During this visit, he returned to Colt and Remington factories, where he again observed the latest manufacturing techniques and the latest machinery available for producing firearms. While in the United States, he learned about the latest developments in breech-loading weapons and took particular interest in the Remington rolling block system. He also was intrigued by developments in metallic cartridges, and when he returned to Austria, he took samples of some of the first rim-fire metallic cartridges.

Although Josef Werndl (together with his brother) had managed his fathers firm since 1853, he was neither satisfied with this shop nor its setup. The old Werndl business was based on manufacturing techniques of the first half of the 19th century. Having studied arms manufacturing both in the United States and in other European nations, he was determined to take a new path for the company. Therefore, on April 16, 1864, he opened Waffenfabrik Joseph und Franz Werndl & Co., using the modern techniques he had learned. Given his gunsmith training, Josef focused on the design and manufacturing part of the operation and his brother focused on the financial side.[8] Although beginning modestly, this was the origin of one of the world's largest firearms manufacturing corporations.

In 1866, Waffenfabrik Joseph and Franz Werndl was successful in landing its first major contract. The Austro–Prussian War in 1866 had conclusively demonstrated the advantages of breech-loading weapons and, as a result, the Austrian government created a breech-loading rifle commission. The design chosen was the **Wänzel** conversion, a trapdoor system, that would convert the obsolete percussion Lorenz rifles to single-shot breech-loading rifles.[9] Since it was a conversion of a single-shot percussion-rifled musket, it was analogous to the systems developed post-Civil War in the United States.[10] The new Werndl factory, J&F Werndl, produced some 80,000 of these conversions.[11]

The Wänzel, however, was only a stopgap measure. A new rifle was needed for the Austrian Army. Karl Holub had developed a design for a new breech-loading rifle that featured a unique rotating axle breech.[12] Initially, Holub retained his patents on his rifle designs, but ultimately Werndl purchased these rights from the man, who was by this time his plant foreman. On July 28, 1867, Werndl/Holub achieved another success when the Austrian Army accepted their design and ordered 100,000 rifles. In the fall, the Austrian government ordered an additional 150,000 pieces from the Werndl factory. With this weapon, the 1867 "Werndl," the company scored its first major success.[13]

Fulfilling the contracts that would come from the Werndl/Holub design and subsequent models was not possible with existing resources, particularly fiscal resources. As a result, on August 1, 1869, the firm of J&F Werndl ceased to exist and in its place the Werndls formed a joint stock company called Österreichische Waffenfabriks-Gesellschaft (OEWG), with its headquarters in Vienna. It was under this name that "Steyr" would achieve its reputation.

Once the joint stock company was formed, successes began to multiply for the new firm, OEWG. The successes were fueled first by the need of many armies to convert to metallic cartridge breech-loading rifles and, within a decade, the need to convert to repeating rifles. OEWG, with Werndl's emphasis on interchangeable parts and powered machinery to facilitate production, was in an excellent position to satisfy these demands. In 1873, The Austrian Army added further to the company's business when an improved version of the Werndl rifle, called the Model 1873, was developed. This weapon was essentially the same as the 1867 except that the hammer was no longer external on a percussion-type lock plate.

From the beginning of the same decade, the company began expanding its business beyond the borders of Austria. In 1871, the German government adopted a new single-shot infantry rifle and, although it was a Mauser design, Mauser and the other German firms were unable to produce the necessary number of weapons to convert the newly formed German Army from the Dreyse "Needle Gun" to a bolt-action rifle firing metallic cartridges.[14] As a consequence, beginning in 1873, Steyr was contracted to produce a half-million Model 1871 Mausers, the Mauser brothers' first commercially successful design. In subsequent months, Steyr would produce 1871 infantry rifles, carbines, and Jägerbuchse.[15] With this contract, Werndl had begun the process of establishing a world reputation for OEWG.[16] In addition, OEWG also picked up contracts to produce Bavarian Werder "Lightning" and convert captured French rifles into carbines, for use in the Bavarian Army. They also produced a short run of the 1872 model Frühwirth carbines for the Austrian Gendarmerie.

Following this success of the German contract, beginning in 1874, Steyr began working with the French government to procure weapons, resulting in the first of two French contracts, which the company would win in the 1870s. The first was for the production of the French rifle Gras Model of 1874, together with an appropriate bayonet for the weapon. Producing both the rifle and the bayonet became a standard practice for Steyr for the remainder of the 19th century. Though the Gras was originally a French design, Steyr also produced Gras rifles for Greece and Chile. This would be the first of several contracts for weapons that Steyr would have with these three nations.

During this same time, conflicts in the Balkans, that is, the Russo Turkish War, caused the King of Rumania to search for a new infantry weapon for his army. The King preferred a Martini–Henry action and, when his original contractor could not produce them in a timely fashion, Joseph Werndl offered to manufacture the weapon and ultimately produced 13,000 11-mm Martini–Henry rifles and carbines, Model 1879, for the Rumanians.[17]

One might say that, in the 1870's, Steyr's business was literally booming because, in 1877, an additional model, more an alteration of the 67/73 Werndl rifle, was developed for use with an improved 11-mm cartridge. Before this design was replaced by the straight-pull series, Werndls were being used by the Austrian Army, the tiny nation of Montenegro, and Persia. At the same time, Werndl worked with another Austrian designer, an artillery officer, Captain Alfred Ritter von Kropatschek, to produce a repeating rifle that used a tubular magazine below the barrel. The first contact for this model, appropriately called the Kropatschek, was from the French government. Under this contract, Steyr would produce a total of 25,000 French Marine rifles, Model 1878. As this decade came to a close, Steyr, originally a small manufacturing firm, had multiple manufacturing facilities and had expanded its workforce to 6,000 workers. As a result, its weekly production was 8,000 rifles.[18]

Designs from individuals like Holub and Kropatchek coupled with Werndl's energy and good business management caused the company to prosper. A large part of the reason for the company's success was their use of the latest modern production techniques, which allowed them to be competitive and to quickly produce a number of substantially different designs. At the 900-year jubilee of the city of Steyr's founding, Joseph Werndl proudly stated:

> Through our technical performance we stand unrivaled in the production of quality weapons and when quality matters we need fear no competition.[19]

In many respects, the best was yet to come for OEWG. The best would come when a talented designer came to work with the firm. This designer was named Ferdinand Ritter von Mannlicher.

Mannlicher was the second individual who should be credited with establishing Steyr as a giant in the field of small arms design. This famous arms designer was not Austrian, but rather German, born in Mainz in 1848. As a young man, he moved to Austria, where he initially studied engineering at Vienna's Technical University. He achieved his early success with the Austrian Imperial Northern Railroad and only later in life turned to firearms design. It was Mannlicher who really took Steyr from the age of the single-shot breechloader into the era of magazine-fed repeaters. In fact, the name Mannlicher is generally better known throughout the world than Werndl or Steyr, the firm that produced his designs.[20]

Although Mannlicher began designing weapons at the onset of the 1880's, his first commercially successful weapon was not produced until 1885.[21] This was the first of Mannlicher's straight-pull designs which, beginning in 1886, was produced using an 11-mm black powder cartridge. In the years that followed, a profusion of designs was produced, both variations of straight-pull designs and at the same time bolt action weapons with split rear ring receivers.

In the mid-1880's, as Mannlicher's successful designs were beginning to emerge, Werndl added yet another famed designer to his employ. He hired Otto Schönauer, who had served his firearms apprenticeship at the Vetterli factory in Neuhausen Switzerland and was later a technician in what is now Czechoslovakia. Schönauer began working for Werndl in 1886 and by 1889 he was the business manager for OEWG. His world reputation would come as the designer of the rotary magazine for bolt-action rifles, mostly utilized for the world famous Mannlicher Schönauer hunting rifles. Although generally thought of in commercial applications, this design

would have military applications through contracts with Greek government in 1903, 1913, and again in 1930.

With this much talent in one company, it is not surprising that the 1880's—carrying on into the 1990's—were perhaps Steyr's greatest years, that is, in terms of firearms design and manufacturing. In the 1880's, variations, actually improvements, of Mannlicher's basic design for the straight-pull rifles, which first emerged at the beginning of the 1880's, were produced in several basic variations and for numerous countries.[22] Austria, Bulgaria, Brazil, Chile, Portugal, Persia, and Siam all used versions of the 1886–1888.

While the original 1886 in 11 mm and the 1888 in 8 mm were being produced for the nations previously mentioned, Steyr showed its wide range of capabilities by developing two entirely different contracts with Portugal. Initially, Steyr agreed to produce a unique falling block rifle for the Portuguese government known as the Guedes, even though it was actually obsolete at the time of its production. This was quickly followed by the production of Kropatschek rifles and carbines for Portugal.

An intriguing chapter for Steyr occurred when the German Army adopted the Commission Model 1888 rifle. Even a casual observer could see that the magazine system used in this weapon "borrowed" heavily on the Mannlicher design, infringing on Steyr's patents. As a consequence, the company initiated a patent infringement suit against the German government.[23] OEWG won the suit and, as a part of the settlement, they were permitted to manufacture Gewehr 88 rifles for the German government and for contracts with other nations as well. Therefore, beginning in 1889, OEWG began producing the model 1888 for the German Army.[24]

The decade of the 1890's saw yet another explosion of designs and Contracts. Steyr began the decade with the manufacture of the Model 1890 Carbine and *Extracorps Gewehr* for the Austrian Army. This was a significant improvement over the straight-pull designs produced from 1885 to 1889, particularly as it related to the positive locking system provided by the two frontal rotary lugs. Using only minor alterations, this design became the 1895 model "Straight-Pull." With the exception of the famed Mannlicher Schönauer hunting rifles, this would be Mannlicher's longest production piece, with these weapons being produced through 1938.[25]

This, however, was only a small portion of Steyr's production in the 1890's. Mannlicher designed and Steyr produced two versions of bolt-action rifles for the Rumanian government, the models of 1892 and 1893. Mannlicher designs, produced by Steyr, resulted in a number of bolt-action variations for the Dutch. At the same time, Steyr also produced a run of Krag Jorgenson rifles for the Norwegians, a carbine for the Swiss, as well as full-scale production for the Model 1895 straight-pull.[26]

As the 19th century came to an end, the Steyr Corporation, which had demonstrated a significant level of diversity in the number of designs it produced throughout the last three decades of the 19th century, began to experience a noticeable problem. Military contracts of significant number and size were decreasing. Several reasons for the slowdown can be given. First, the original design creativity shown by Steyr from the mid-1860s to the end of the century slowed. A major factor was likely a series of deaths, which took some notable people out of the corporate ladder. Josef Werndl, the man who had founded the industrial giant, died on April 29, 1889. Fifteen years later, on January 30, 1904, Ferdinand Mannlicher died and in the next year, on May 23, 1905, Karl Holub died. As these design and manufacturing geniuses expired, Steyr's greatest period of originality in terms of firearm design and manufacturing passed.

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## SECTION II: 1900–1945

From the mid-1880s until the end of that century, Steyr had been the most proficient producer of straight-pull designs, supplying countries all over Europe and Latin America with variations of this design. Conversely, a survey of the major nations at the beginning of the 20th century shows that the weapon of choice was becoming the turn-bolt system, which was rapidly being identified with the German company Mauser. Granted, Steyr had begun producing its own turn-bolt design in the 1890s, a split-bridge receiver design that found favor in the Netherlands, Rumania, and numerous turn of the century Mannlicher sporting designs. Still, the mainstay of Steyr military production was the straight-pull, which was rapidly being eclipsed by turn-bolt systems.

Beyond this problem, however, lay a deeper systemic problem for Austria's major firearms firm. The government's support and promotion of the industry was at best lukewarm. In fact, the Hapsburg government had never promoted trade industry and imperial expansion as had their neighbor to the north, Germany. The German Government aggressively promoted trade and industry, assisting companies to further the country's business progress. Among the firms that benefited from this trade expansion were weapons manufacturing firms like Mauser and Krupp. Neither Austrian industries in general nor Steyr in particular ever had the level of governmental interest or support that their contemporaries in Germany had.

As early as the mid-1890s, officials at Steyr recognized that the boom that had characterized the 1870s and 1880s was slowing. In that heyday, countries were switching from muzzle- to breech-loading weapons, from black powder to smokeless powder, and from single-shot to repeating

weapons. This drive to modernization, however, was subsiding. As a consequence, Steyr began taking its first steps toward diversifying its line of products. Thus, in 1894, Steyr added bicycles to its line of products. According to the company's advertisements, its specialty line was military bicycles.[1] This was Steyr's first step, but by no means their last at diversification, and it was an apparent success.[2]

While this seemed to be a step in the right direction, the problems facing Steyr seemed to be increasing. Thus, as the 20th century dawned, the problems for Steyr seemed to accelerate. For example, in the late 19th century, Steyr had furnished Portugal with first the Guedes and then the Kropatshek rifles. Despite this seeming success, at the beginning of the 20th century, the Portuguese dropped Steyr and adopted a Mauser design called the Mauser–Vegueiro. Contracts for the numerous variants of the 1892/1895 Dutch rifle also disappeared when the Dutch's own Hembrug arsenal began producing both rifles and carbines for its armies under license from Steyr. This trend did not threaten to bankrupt the Austrian firm but, at the same time, the new contracts and new designs were simply not appearing.

Thus, Steyr found it necessary to enter into a German-led cartel to insure that they could get a share of the expanding Model 98 market and keep some of their production lines in operation. In the early part of the 20th century, Steyr began producing its own version of the Mauser 98. The earliest customers for these weapons appear to have been the 1907 Mexican Mauser rifle and the 1908 Serbian carbine. These early Mauser pattern designs did not produce huge contracts of long duration, but the ability to produce a Mauser design did result in a significant production run, the Steyr Model of 1912 (a Mauser 98). The Model 1912 was a successful venture for Steyr because it again re-opened markets to Steyr in Latin America, an area where they had been successful in the 1880s with the earlier straight-pull designs. Thus, Columbia, Chile, and Mexico ordered 1912 Model 98s in long- and carbine-length models. Chilean and Columbian rifles appear to have reached their destinations in good numbers but exactly how many of the Steyr 98s were actually delivered to Mexico is somewhat hard to determine.[3] While some of the 1912s were delivered to Mexico, others, originally destined for Mexico, were impressed into Austrian service due to the onset of World War I.

Even as a new production line was producing Model 98s, Steyr continued to produce its Model 1895 straight-pull rifle. Despite the fact that this design did not find favor among the major powers, it was certainly one of Mannlicher's most famous designs. From the 1890s through the war years, the Model 95 was one of Steyr's consistent successes. It had its origins in the mid-1880s with the commercially successful 1886. This original design, initially a black-powder weapon, had the traditional Mannlicher packet-type magazine and a bolt that locked for firing with a falling block or wedge that engaged the lower receiver at the rear of the magazine well. This Mannlicher system was significantly improved with the transitional 1890 model, produced only in short versions by the dual lug turning bolt head design which, with minor alterations, would be the mainstay of the Austrian Army until 1938. It would also serve the Armies of Hungary, Bulgaria, Czechoslovakia, Rumania, and Yugoslavia, among others.

As mentioned previously, during the 1890's and the first decade of the 20th century, the other basic system produced by Steyr was the split-receiver bridge bolt action that had either the traditional Mannlicher packet-style magazine or, particularly with the commercials through which Steyr was to become so famous, the Schönauer rotary magazine. Examples of the former consist of the multitude of Dutch designs produced beginning in 1892 to the Rumanian contracts of the same period. Examples of the latter include the world-famous Mannlicher Schönauer hunting rifles, and beginning in 1903, the Greek military contracts.[4] The Greek contract of 1903 required Steyr to produce both long and carbine models, which were produced through the 1903/14 model. Much like the 1912 Mexican Mauser, some of the later weapons produced were not delivered but were impressed into Austrian service for WWI.[5]

In the same period, Steyr, which had distinguished itself from 1864–1890 almost exclusively in the manufacture of long guns, in the first decade of the 20th century moved into new fields of design and manufacture. Mannlicher is usually thought of in terms of his rifle designers, but his patent drawings show his interest, as early as the 1890s, in handgun design. Beginning in 1894, Mannlicher attempted to develop workable designs so Steyr could enter the handgun market. Of the designs he produced, the models 1900, 1901, and 1905 pistols were by far the most successful. In particular, the 1905 Mannlicher pistol was well received, was adopted by Argentina, and was marketed throughout Europe commercially.[6]

In the same timeframe, 1909, Steyr also began to produce, under license from the Belgian Pieper firm, a 7.65-mm blow-back pistol, which was widely used during the war and in the postwar years by K.U.K. Officers. This unique pistol, which featured a tip-up barrel, was also produced in 6.35 mm and both were utilized a self-defense weapon by Austro–Hungarian officers. Again, this was a pistol produced under license, not a Steyr design.

In terms of actual Steyr-designed pistols, the Model 1907 Roth–Steyr pistol was the next significant venture into the area of handgun manufacture. Though somewhat ugly in overall appearance, this pistol was beautifully machined and finished but was complicated and expensive to manufacture. Other than its adoption by the Austro–Hungarian Armies, its impact on firearms development and/or the financial fortunes

**Figure 1. Steyr never excelled in pistol manufacture but was best known for rifle production both military and civilian. These three designs are the most often encountered handguns produced by Steyr: the Roth Steyr; the Steyr Hahn; and the P35 (P), produced under Steyr supervision at Radom Poland.**

of Steyr was minimal. Note that, like many Austro–Hungarian weapons, it was produced both by Steyr and by Budapest. In 1911, however, Steyr began producing their best known handgun, nicknamed the Steyr–Hahn. Available commercially in 1911, it was adopted by the Austro–Hungarian Armies in 1912 and served first the K.U.K. military and then the Austrian Army until Austria was absorbed into the Reich in 1938. Once this event occurred, the Germans converted a number of these 1912 Steyrs to 9-mm Luger and they were issued to police and second line units.

The final new area for Steyr was that of machinegun manufacture. Mannlicher had experimented with both handheld and shoulder-fired automatic weapons but had not successfully ventured into machinegun design. Steyr, however, recognized the market for these weapons, though belatedly. As a result, under license with the inventor, Andreas Schwarzlose, a German, Steyr began manufacturing the Model 1907 machinegun, which transitioned into the Model 1907/12 heavy machinegun. This designed was produced throughout World War I, and licensed by Sweden and Holland. These weapons were used after the war by the Czechs, Yugoslavs, and Rumanians as well as the Austrians and Hungarians. They also saw limited service with the Wehrmacht during World War II.

Despite expansions into various other fields, Steyr's philosophy of production, as established by Joseph Werndl, continued into the 20th century. In a catalog dated November 1914, Österreiche Waffenfabriks Gesellschaft stated with pride, " . . . all arms turned out from their works are produced in strict accordance with the principle of interchangeability of all parts." In addition, the plant brochure stated that the Austrian Small Arms Factory was capable of turning out 750,000 arms of different systems per year. This represented an output of 15,000 arms per week and 2,500 arms per day.[7] Although Werndl had been dead for 25 years, his philosophy remained.

As the war years came, Steyr-Werke was an extremely efficient producer of weapons for World War I. During the period 1914–1918, Steyr produced rifles, rifle spare parts, pistols, and machine guns in addition to bicycles and aircraft engines. Employing upwards to 14,000 workers, the plant in 4 1/2 years produced 3,000,325 rifles, carbines, and Stutzen, 234,919 pistols, 40,524 machine guns, and 20,000,000 arms parts and components.[8] The mainstays of production during this period were the standard versions of the M-95 rifle, Stutzen, and carbine, with the addition of a sniper version of the rifle, the Model 1912 Steyr–Hahn and the Schwarzlose in heavy, light, and aircraft versions. In addition, Steyr-Werk also inspected, proofed, and, in some instances, altered many of the thousands of captured Russian Mosin Nagants that were scooped up on the Eastern front and later re-issued to the Austrian Army.

With the end of the war in 1918, Austria, as one of the Central Powers, was held responsible for initiating the First World War. By the terms of the 1919 Treaty of St. Germain, the Dual Monarchy was dismembered. Its Army, which had fielded some 4 million men for the war, was cut to 30,000 men. Its arms industry, that is, Steyr, which had been one of the largest arms manufacturers in Europe, was virtually prohibited from producing military weapons. The company that prided itself, at the onset of the war, on its proven capability to produce 750,000 arms of different systems per year or 15,000 arms per week or 2,500 weapons a day, was cut to essentially the European sporting weapons market.

In all honesty, even without the provisions of the Treaty of St. Germain, the post-world war arms market would have been slim. Not only was Austria's Army cut to a bare minimum, the Empire itself was reduced to a small rump state, formed around the core of Austria. St. Germain would have threatened the existence of the plant had it not been for some wise decisions made during and immediately after the war.

In 1916, the company had decided to build a plant to produce automobiles. The company forged ahead through the last half of the War and completed a plant, using the expertise of a noted automobile designer named Hans Ledwinka, whom they had hired for this effort. The new plant would produce

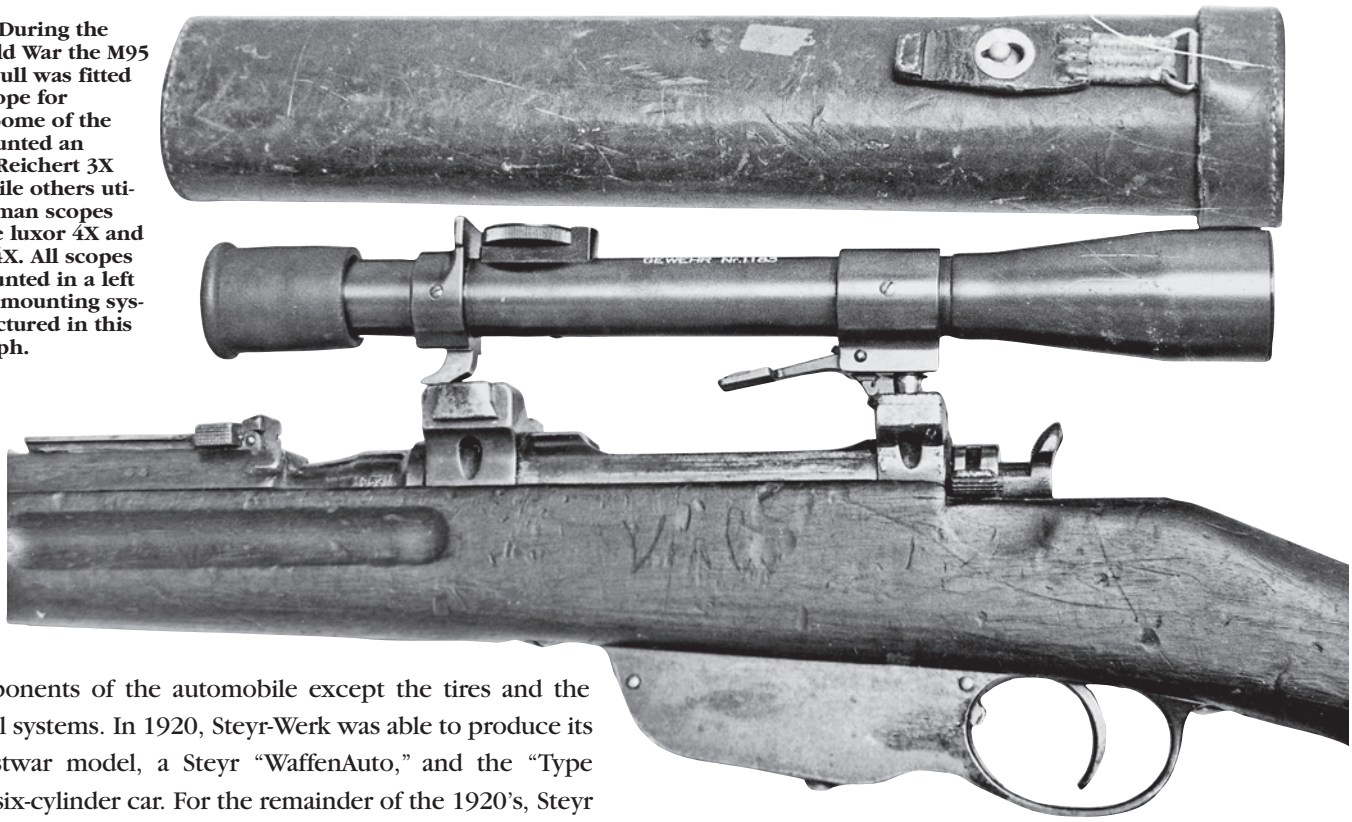

**Figure 2. During the First World War the M95 straight pull was fitted with a scope for snipers. Some of the rifles mounted an Austrian Reichert 3X scope while others utilized German scopes like Oigee luxor 4X and R. Fuess 4X. All scopes were mounted in a left of center mounting system as pictured in this photograph.**

all components of the automobile except the tires and the electrical systems. In 1920, Steyr-Werk was able to produce its first postwar model, a Steyr "WaffenAuto," and the "Type Two," a six-cylinder car. For the remainder of the 1920's, Steyr produced a number of different models of automobiles, all of which were known for their high quality, in addition to motorcycles and trucks. This success story, however, was cut short by the worldwide depression, which began with the stock market crash in October, 1929.

The depression caused a sharp decrease in the demand for automobiles and, as a result, as the company began the decade of the 1930's, it was again faced with potential financial problems. There were, however, two significant mitigating factors that helped Steyr avoid a major financial crisis. First, on June 27, 1929, immediately prior to the onset of the depression, Steyr established a partnership with the Swiss firm Solothurn AG in Switzerland. Solothurn was actually owned by Rheinmetal in Germany. Thus, for a second time, the corporation developed a strong relationship with a German Corporation. Second, in 1934, Steyr, which had established an excellent reputation in the automobile industry, joined together with the Wiener Neustadt firm of Austro–Daimler Puch Werke A.G. to form Steyr-Werke A.G. Austro–Daimler, which already had an excellent reputation for producing bicycles, motorcycles, automobiles, and trucks, gave the corporation even more capabilities to remain afloat during the troubled depression years.

As a consequence of these consolidations and affiliations, Steyr was able to maintain its existence and in the armament field, again, pick up foreign contracts. From this partnership with Solothurn, Steyr produced a number of different weapons. The first new model was the model 1929 Mauser action rifle. Much like the K98K, this weapon was a shortened version of the WWI vintage 1912 Steyr Mauser. Unique through the rather pointed pistol grip stock, this weapon bore the mark on the left receiver rail, clearly showing the new affiliation, Steyr-Solothurn A.G. While it seems to have been intended as a design that could be marketed commercially, worldwide, the only existent examples have the Columbian crest on the receiver.

A second commercial venture was the Steyr-Solothurn-designed submachine gun initially referred to as Steyr Machinenpistole S1-100, latter known as the MP-34. This select fire weapon, beautifully machined, had a commercial-quality finish and was apparently marketed widely and successfully. After the initial prototypes were produced, an additional feature, the provision for mounting a bayonet, was added. This weapon would be ordered by a number of countries and in a number of calibers. It was adopted by the Austrian Army in 9-mm Steyr. The Swiss placed an order for these beautiful weapons in .30 caliber Luger. The Swiss example in the author's collection shows a unique monogram with interlocking SS, indicating Steyr Solothurn. Orders were also forthcoming from Japan, China, and Portugal. The weapon was also marketed to at least one South American country, Guatamala, for which Steyr produced the weapons in .45 acp.[9]

In the same time period, Steyr entered another field. It began producing the Model 1930 light machine gun, a magazine-fed bipod-mounted light machine gun, for both the Austrian Army and the Hungarians. This was a commercial venture as well and these weapons were also sold

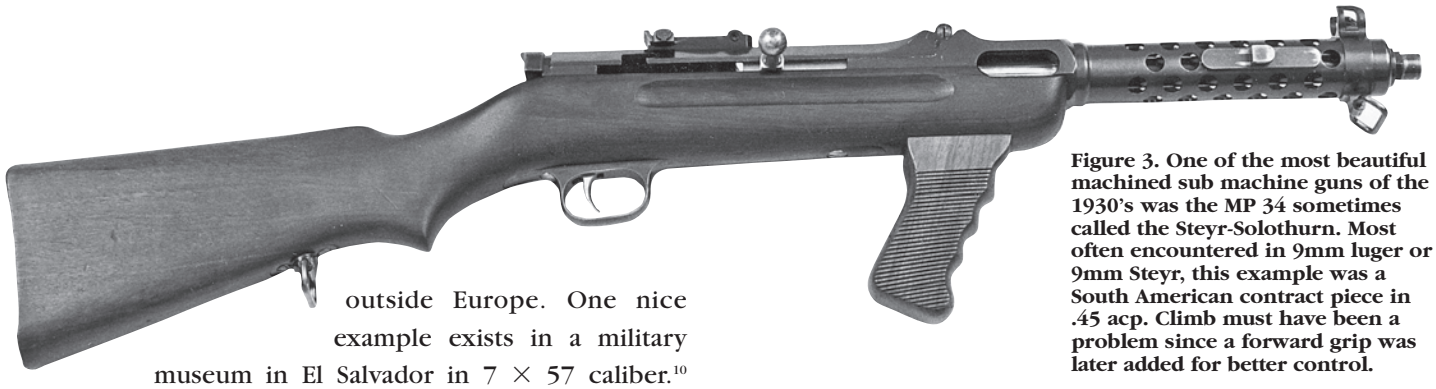

**Figure 3. One of the most beautiful machined sub machine guns of the 1930's was the MP 34 sometimes called the Steyr-Solothurn. Most often encountered in 9mm luger or 9mm Steyr, this example was a South American contract piece in .45 acp. Climb must have been a problem since a forward grip was later added for better control.**

outside Europe. One nice example exists in a military museum in El Salvador in 7 × 57 caliber.[10] Prior to producing this weapon, its only entry into full automatic weapons had been the Schwarzlose machine gun, normally produced in a heavy version, and the little known select fire version of the Steyr-Hahn, the model 1916. Production of a new weapons system was also something new for the Austrian Army in this period. The Austrian Army of the 1920s did not provide much of a market for weapons production. It was extremely small, much like the Reichswehr to the north, and had an abundance of M-95 rifles, Stutzen, and carbines, surplus weapons from the First World War.[11] Either Steyr and/or Austrian arsenals continued to modify or assemble some weapons after the war, mostly in Stutzen configuration, but no big contracts were forthcoming. Steyr continued to manufacture Steyr-Hahns during this period, but business from the Austrian government was extremely limited.

Another contract that should be noted was an order from the Greek government. The model produced was the 1930 Carbine, a weapon with the distinctive Mannlicher Schönauer design, and one that was virtually identical to the Greek contracts at the beginning of the century. The Greek model 1930, as well as the 1912 Steyr Hahn's produced in this timeframe, were distinguished by the new markings, the distinctive Steyr bull's-eye, the trademark that had supplanted the simple marking Steyr or the older OEWG.

Still, overall, the effects of the depression, coupled with the effects of the Treaty of St. Germain, meant that the Military Arms Industry was not at all the most lucrative and, in the postwar Austrian Republic, there seemed to be few options to greatly improve the state of what had once been the largest arms manufacturer in Europe. All of this would change in 1938 because of what became known as *Anschluss.* Austria became part of the greater German Reich—with its rapidly expanding military.

In the 1939, 75-year history of Steyr Works, the period 1938/39 was referred to as the building, or better yet, the rebuilding of the Steyr plant and its regeneration as a major manufacturer of military arms. From the onset of this period, Steyr rapidly moved into becoming a major supplier of K98s. Its first model, produced from 1938 through 1939, was the so-called G29 Ö, a resurrection of the 1929 contract rifle. In the same period, 1938/39, Steyr, like Mauser, rebuilt Gewehr 98s into K98K configuration, many of them for the rapidly expanding Waffen S.S. They were appropriately proofed on the barrel with the traditional runes and the skull and crossbones. In this early period, Steyr made weapons were marked with the early numerical code 660. They were also tasked with converting Steyr-Hahns to 9-mm Luger, making them more compatible with the German supply system. Evidence exists as well that, in the early war years, they rebuilt some older Luger pistols to include rebarreling the pistols, if necessary.

At the same time, Steyr manufactured for the German Army what had then become known as the MP34, a later version of the prewar S1-100. Production of this weapon would continue intermittently until 1942. Despite the ever-increasing demands of the war, Steyr accept an order for MP34 machine pistols from Portugal and produced a number of these weapons for that country. After 1942, this weapon, too complicated and too expensive to manufacture, was discontinued. Taking its place, beginning in the early stages of the war, was the MP40. Once the line for MP40 was opened, Steyr first produced the transitional MP38/40 and then the more familiar standard MP40. It appears to have been the only company to produce, in limited numbers, the dual-magazine version, called by some the MP40 I, which mounted two magazines side by side, allowing the user to slide the second 30-round magazine into position once the first one had been expended. Additionally, at the beginning of the 1940's, Steyr began producing MG34 light machine guns for the German Army. With the adoption of the MG42 into the German inventory, Steyr also began production of this weapon, which was dreaded by American G.I.s. Before the Third Reich entered the dustbin of history, it also became a manufacturer of the MP44 Assault Rifle.

In the early war period, Steyr rapidly expanded with the fortunes of war. With the fall of Poland, Steyr took control of the arsenal at Radom and began assembling K98s there, first utilizing Polish components and laminate stocks, some of which were supplied by the Brno arsenal and marked dot on the toe. These early transitional models retained the Polish


**Figure 4. After the Polish campaign Steyr technicians operated the Radom plant in Poland. This resulted in a number of K98Ks being assembled with Polish/German parts. This all matching example has the Polish eagle on the receiver and the Steyr's 660 code. Both the stock and handguard were subcontracted from Brno.**

eagle on the receiver and the Steyr code, 660. By operating the Radom arsenal, Steyr inherited a pistol design noted for its reliability, the P35 (p) or 9-mm Radom. For most Ameri-cans, the similarity of this weapon to the 1911 Colt is striking. This pistol would be produced in Poland from the beginning of the war until the city of Radom was overrun by the Russians. When Radom was in danger of being overrun, Steyr technicians moved much of the equipment to Steyr, Austria and continued to produce a crude version of the pistol there until the end of the war.

Above all, however, the mainstay of Steyr's production was the K98K. A number of things are interesting about Steyr's production for the war effort. First, they initially assembled K98s in their facilities at Steyr and at the occupied Radom factory in Poland. In late 1942 or early 1943, they added another facility to their efforts, Mauthausen Concentration Camp. That the S.S. used some camps as manufacturing plants—with their source of free labor—has been known for a number of years, but the assembly of rifles by camp inmates is even today surprising to many people. Mauthausen apparently did not do a lot of the actual manufacturing of components but worked more as an assembly plant.

The Mauthausen pieces, which seemed to have been made in 1943 or 1944, are indistinguishable from factory-made pieces except that they are marked with a single runic S, which is normally positioned between the factory code and the date of manufacture. These K98s with this unusual marking have been erroneously identified as S.S. rifles or Hitler Youth weapons.[12] As a part of this production at Mauthausen, some components supplied to the plant were Gewehr 98 receivers, which were given the bnz Steyr code and the single rune. A word of caution to collectors, the Mauthausen-assembled rifles are extremely easy to manufacture by forgers with only rudimentary skills.


**Figure 5. In 1943–44 Steyr had a facility at Mauthausen Concentration Camp for the assembly of K98Ks. These rifles are normally marked "bnz4" with a single rune in between. While these rifles are desirable, they are also easily forged due to the simplicity of the proof. The buyer should be extremely cautious on there.**

Steyr, between 1943 and the end of the war, produced two versions of Sniper rifles for the *Wehrmacht*. The first was unique to Steyr in design. Produced in the 1943/44 time frame, it consisted of a 4-power scope, normally coded bmj, which was mounted off to the left of the receiver. While one author noted that JP Sauer and Son (code CE) also made some of these rifles, the similarity of this design to Steyr's World War I Sniper clearly indicates the Austrian inspiration for this design.[13] The two rings were locked into the left-mounted bases with single claws rather than the normal two claws per ring configuration.

The second sniper version was even more exotic. It featured an improved version of an over-the-bore claw mount that had been popular in Germany and Czechoslovakia before the war. Mounted in these rings was a Czech manufactured (dow) 4-power scope, which had a unique center sleeve that controlled elevation.

Steyr was not the only manufacturer of this version and, interestingly enough, most of these rifles show S.S. acceptance on the barrel. Some insist that these unique rifles were adapted to sniper version through the efforts of armorers, simply using existing stocks of rifles. This is possible, although the strong connection that developed between Steyr and the S.S. in


**Figure 6. Steyr was one of the major producers of Volksturm rifles. Normally these are marked "Mod 98 bnz 45" on the receivers, but Steyr also used older receivers apparently from old part stocks like this 1940 manufactured receiver.**

1943/44 and the significant number of these weapons manufactured by Steyr seem to suggest that they may well have been factory produced.

**Figure 7. Typical of VG 98s is the front sight with no provision for any type of adjustment and arc welded to the barrel which was 20 3/4 inches long, shorter than the standard 98.**

A final 98 version produced by Steyr is the Volksturm Gewehr. In the waning period of the Third Reich, as both weapons and manpower were in short supply, Steyr became one of the primary manufacturers of this weapon. The Steyr VG98 was a simplified (at best) version of the classic K98K. As manufactured, this rifle had a half stock, a simple plank configuration, made of beech wood. Some of the earlier versions used a dubbed standard stock. The metal finish was phosphate and, other than the stock, the most unique feature of these weapons were the sights. The front sight was hastily manufactured from two pieces of metal and was permanently welded to the barrel. The rear sight was a simple "V" sight, dovetailed into the receiver. A steel butt plate was normally not present.[14] Thus, in 6 years, Steyr had gone from the high quality of the G 29 Ö, to the VG98. However, by 1945, Steyr's days, like those of the Third Reich, were numbered.

In Early May 1945, elements of the U.S. Army and the Soviet Army joined hands in Steyr, Austria. The actual Steyr plant fell into Soviet hands. In typical Soviet style, much of the contents were looted, destroying all too much of Steyr's history. Austria, now under four-power occupation, and the occupiers closed the plant, which would cause a cessation of all arms manufacturing, both civilian and military. Steyr's production lines would not open again until 1950.

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NOTES PART I

1. Steyr Mannlicher, Ges.m.b.H. *125 Jahre Waffen aus Steyr* (Steyr, Austria: N.P., 1989), pp. 1–3. Cited hereafter as Steyr, *125 Jahre Waffen aus Steyr*.

2. Steyr, *125 Jahre Waffen aus Steyr*, p. 3.

3. For the reader who seeks additional biographical information on the Werndls, see Hans Gustl Kernmayr, *Leopold Werndl und sein Sohn* (Graz: 1949).

4. Fritz H. Baer. "Werndl versus Gasser—Pistole gegen Revolver: Ein Beitrag zur Waffen und Wirtschaftgeschichte," *Miltaria Austriaca* Nu. 5. (Wein: Gesellschaft fur Öesterreiche Heereskunde, 1989), p. 19. Cited hereafter as Baer, *Werndl vs. Gasser*.

5. Steyr Mannlicher Ges.m.b.H. *Joseph Werndl 1831–1889: Leben und Werk*. (Steyr, Austria: N.P. 1989), p. 2. Cited hereafter as Steyr, *Joseph Werndl*.

6. Baer, *Werndl vs. Gasser*, p. 19.

7. Karl Holub was a trusted and long-term associate of Josef Werndl. He was born in what is now Czechoslovakia and initially worked as a locksmith. Before entering the Army, he was apprenticed to the Austrian State Arsenal in Vienna, where he became acquainted with Josef Werndl. He subsequently entered military service and, when he completed his military duty, Holub began working for Werndl as the latter was developing his factory. As mentioned, he accompanied Werndl on his second trip to the United States and collected information on modern manufacturing techniques, information that was used in the construction of the new arms factory that Werndl was building.

8. *Steyr 1964: The Steyr–Daimler–Puch Aktiengesellschaft in the Centenary Year of its Foundation*, p. 2.

9. The reader should note as well that there was considerable interest in this period in the Remington Rolling Block system, which in fact resulted in the production of a limited number of Austrian Rolling blocks.

10. In fact, in his article, "Wiener Walze," *Visier: Internationale Waffen-Magazin* (November, 1990), p. 116, Wolfram Kriegleder stated The Viennese Gunsmith Johann Wänzel copied the "trapdoor" breech design by Erskin Allin.

11. The Werndl firm was only one of several companies that converted Lorenzes to breechloaders. According to factory publications, in a short time, some 700,000 Lorenz rifles were converted to breechloaders. See Steyr, *125 Jahre Waffen*, p. 5.

12. It should be noted that, while Werndl produced several different models of long guns, based on this design, the firm also offered a single-shot pistol based on this same breech-loading design. In the end, however, the Gasser revolver, Model 1870, would be adopted by the Austrian military forces. See, Baer, *Werndl vs. Gasser*, pp. 21–41.

13. Ibid, p. 5. It should be noted, however, that the Werndl Fabrik was not the sole firm producing these 1867 Werndl/Holub designed rifles. In the years that followed, numerous companies in Austria produced "Werndls" and, in addition, another facility was established in Hungary to handle the increased business.

14. The German Army was a newly formed Army since the German Army only came into being with the 1870–1871 Franco Prussian War. The basic problem for the German manufacturers trying to meet the contract was that some of the new machinery needed to produce the rifles did not arrive in time and, in addition, the more exacting tolerances for the 1871 were difficult for some of the arsenals attempting to manufacture the 71's. John Walter, *The German Rifle: A Comprehensive Illustrated History of the Standard Bolt-Action Designs, 1871–1945* (Ontario, Canada: Fortress Publications, Inc., 1979), p. 53. Walter states that the actual production figures from Steyr were 474,622 rifles, 60,000 carbines, 150,000 bolts, 55,963 receivers, and 52,000 barrels to Prussia and Saxony.

15. Wilhelm Voss. *75 Jahre Steyr–Werke: Steyr–Daimler Puch+Aktiengesellschaft Sitz: Steyr, Oberdonau* (Steyr Werke, 1939). pp. 25, 26. Cited hereafter as Voss, *75 Jahre Steyr*.

16. According to Ludwig Olson, OEWG also furnished 70,000 rifles to China, Japan, Honduras, Uruguay, and Transvaal. See Ludwig Olsen, *Mauser Bolt Rifles* (Montezuma, Iowa: F. Brownell, 1993), p. 23. Cited hereafter as Olson, *Mauser Bolt Rifles*.

17. Voss, *75 Jahre Steyr*, p. 27.

18. Steyr, *125 Jahre Waffen aus Steyr,* p.6.

19. Voss, *75 Jahre Steyr*, p. 28.

20. A brief biography on Mannlicher and his background can be found in "Erfinderpersonlichkeiten," Steyr, *125 Jahre Waffen aus Steyr,* p. 12.

21. Ludwig Olson, "Mannlicher Rifles," *The American*

*Rifleman* (November, 1959) p. 40. Olson notes that the 1885 was really the first Mannlicher design to get beyond the experimental stage.

22. Mannlicher's patent drawings for the last two decades of the 19th century can be seen in Oberst Konrad Edler von Kromar's *Repetier- und Automatische Handfeuer Waffen des Systeme Ferdinand Ritter von Mannlicher* (Wien: L.W. Seidel & Sohn, 1900).

23. Note that this Model 88 was a commission product, NOT a Mauser. Thus, Olson notes that the Mauser factory was very busy with other contracts and did not produce any 88 Commission weapons. Furthermore, Paul Mauser, who was not in any way involved in the Model 88 production, was relieved that he did not have to pay royalties to his major rival for using the Mannlicher magazine design. Olson, *Mauser Bolt Rifles*, p. 41.

24. Paul Scarlatta, and James Walters, "The first was Germany's Gewehr 88 Commission Rifle: The Launching Platform for the 7.9 × 57 cartridge," *Shotgun News* (Vol. 56, no. 12, April 20, 2002), pp. 18, 19.

25. The exact number of M-95's produced may never be known. In 1945, the Russians took or destroyed most of the production records. Wartime (WWI) shows that between 1914 and 1918 at Steyr and Budapest a total of 3,593,475 M-95s were produced. See Josef Mötz, "Das Mannlicher Waffen System Muster 1895, III Teil" *Deutsches Waffen Journal* (Mai 1987), p. 793.

26. According to a Norwegian publication, Norway contracted with Steyr, November 21, 1895, to manufacture 20,000 Norwegian Krags. In August 1896, a further 9,000 were ordered together with 4,500 for civilian shooting associations, Karl Hanevek, Krag-Jorgensen Gevaeret (Halden: Hanek Vapen ANS, 1994) p. 127.

NOTES PART II

1. Wilhelm Voss. *75 Jahre Steyr-Werke: Steyr-Daimler Puch+Aktiengesellschaft Sitz: Steyr, Oberdonau* (Steyr Werke, 1939). p. 33.

2. Steyr Mannlicher, Ges.m.b.H. *125 Jahre Waffen aus Steyr* (Steyr, Austria: N.P., 1989). p. 8. Cited hereafter as Steyr, *125 Jahre Waffen aus Steyr*.

3. One notable author maintains that 67,000 Mexican rifles were retained for the K.U.K. armies. See, John Walter, *Central Powers Small Arms of World War One* (Wiltshire, U.K.: The Crowood Press, 1999). p. 153.

4. A good read on this subject is Paul Scarlatta's "The Greek M. 1903/14, Mannlicher Schoenauer: The Most Elegant Military Rifle of All Time." *Men At Arms* (Vol. XX, Number 2), pp. 38–42.

5. In the case of both the Mexican MOD 98 and the Greek 03/14, the basic alteration necessary for these weapons to serve the K.U.K. Army was the alteration of the sling swivels since the Austrians tended to use wider slings than those countries. The calibers of these pieces, however, remained as contracted.

6. The writer was in fact surprised to find in a group of World War I souvenirs, from an attic, consisting of British and French items, a 1905 Mannlicher pistol with the Markings of a French arms company engraved on the barrel, and a French holster.

7. Oesterreichische Waffenfarbriks-Gesellschaft, *The Mannlicher Schoener Repeating Sporting Rifle* (Steyr: Emil Prietzel, 1914), p. 5.

8. Voss, *75 Jahre Steyr Werke*, p. 42.

9. Note that the standard MP34 had a built-in magazine loader/charger assembly in the side-mounted magazine well. In the case of the .45-caliber version, the larger magazine well caused Steyr to drop this feature from this larger and heavier version. This version together with the Swiss model are perhaps the rarest variants of this weapon, other than the original S1-100 itself.

10. I refer to this as a Steyr weapon, while one notable machine gun expert refers to this as a Swiss Solothurn product. I suspect it was both since export weapons, like the Gewehr 29, made for Columbia is marked Steyr–Solothurn on the side rail and the Swiss MP34 also shows Steyr–Solothurn as the manufacturer. See Peter G. Kokalis, "Museo Militar Cuartel El Zapote: El Salvador's Military Museum," *The Shotgun News* (Volume 59, issue 8) pp. 18, 19.

11. At the same time, M-95 Stutzens were assembled in Steyr virtually until the German *Anschluss*. One nice example in the author's collection is dated 1938; another is dated 1937.

12. The standard marking is on the front receiver ring, but some examples of Mauthausen 98s also show a runic S. on the floor plate and on the underside of the rear sight sleeve.

13. See Richard D. Law, *Backbone of the Wehrmacht: Sniper Volume II: Variations of the German K98k Rifle*, R. Blake Stevens, ed. (Cobourg, Ontario, Canada, 1996), p. 117.

14. W. Darrin Weaver, *Desperate Measures: The Last Ditch Weapons of the Nazi Volkssturm* (Cobourg, Ontario, Canada: Collector Grade Publications, 2005), pp. 207–226.