The Survival Files #3

Rarity and Survival of the Whitney Percussion Revolvers

By Jeff Goodson and Philip Boulton

The Survival Files series examines the rarity and survival of antique American firearms. It is based primarily on the database of British antique arms collector Philip Boulton, who has recorded serial numbers on over 85,000 percussion revolvers since 1970.

Survival Files #3 examines the rarity and survival of the nine percussion revolvers produced by Eli Whitney, Jr. at the Whitneyville Armory from 1850-1867. It calculates known survival rates for the last three models that Whitney manufactured—the Navy, Pocket and New Model pocket or "Root" revolver. It also examines how closely the *known* survival rates of these three models approximate their *true* survival rates.

BACKGROUND

The Whitney firearms dynasty started in 1798 with a musket contract between the U.S. Army and Eli Whitney, Sr. He established the Whitneyville Armory about two miles north of New Haven, Connecticut, and manufactured U.S. military longarms there until his death in 1825. The business was then run by family and trustees until 1842, when his son Eli took it over. Eli Whitney, Jr. ran the business until 1888, when it was sold to the Winchester Repeating Arms Company. Winchester immediately closed the factory, and pulled Whitney firearms from the market (Flayderman).

During ninety years of operation, the Whitney firearms dynasty saw American rifle technology evolve from early flintlocks to lever-action repeaters, and handguns evolve from hand-rotated percussion revolvers to rimfire breech-loaders firing metallic cartridges.

Whitney's involvement with revolving handguns started in 1846, when Sam Colt was negotiating a U.S. government contract to make 1,000 revolvers for the Mexican-American war—the famous 'Walker Colts' that he was designing in collaboration with Captain Samuel H. Walker of the U.S. Mounted Rifles. Colt's own factory, which had made his Paterson model revolvers in the 1830s, had long since closed and he was urgently looking for someone who could manufacture the 1,000 guns on a tight schedule. His first stop was Eli Whitney, since Whitney's gun factory had been operating non-stop for nearly fifty years. At first Whitney demurred; he was, after all, a rifle maker. But he finally signed a contract with Colt to make the guns on January 13, 1847, and successfully completed the job by the July deadline (Edwards).

Over the next three years, Whitney—along with several other gun manufacturers—started working on designs that could compete with Colt's increasingly successful revolver business. Colt in turn aggressively tried to stamp out the competition. In 1849, Edwin Wesson received a patent (#6669) for a bevel gear that rotated a revolver's cylinder when the hammer

was pulled. This was a seminal idea, and by 1850 Wesson-patent guns made by Massachusetts Arms were starting to hit the market. Colt had managed to delay but not kill Wesson's 1849 patent, and in 1850 Colt sued Massachusetts Arms for patent infringement over their Wesson & Leavitt revolvers. The lawsuit went to trial in June 1851; Colt won (Edwards).

In the next twenty years, Whitney would make nine models of percussion revolver. The first five models were severely restricted by Colt's revolving cylinder patent. That patent expired in February 1857, and within a year Whitney—along with Allen & Wheelock, Massachusetts Arms, Remington, Warner, and Smith & Wesson—had mechanically rotated revolvers ready for the market (Garavaglia and Worman). Whitney's last percussion revolvers were made about 1867.

THE WHITNEY PERCUSSION REVOLVERS

Observations on rarity and factors affecting survival are provided below on all nine models of Whitney percussion revolvers. For the first six models, insufficient data exist to support valid conclusions about known survival rates. This is because there is insufficient evidence to support a solid production estimate, no serial number data have been collected on the model, and/or the period of data collection was too short.

For the last three models, known survival rate data are calculated (Table 1). A 'stability index' is also calculated for each model, based on the number of new serial numbers added to the Boulton database from January 1, 2017-December 31, 2019. This number, expressed as percentage increase per year, indicates how rapidly guns are being added to the database, and therefore how closely the *known* survival rate as of that time approximates the *true* survival rate of the model (Goodson and Boulton).

Whitney Prototype Hooded Cylinder Revolver

This .36 caliber 5-shot pistol is the first prototype Whitney revolver. It was made either in the late 1840s or 1850 (Fuller). Flayderman lists total production as 'unknown; very limited, rare.' Only one specimen, an unfinished experimental piece, has a mechanically rotated cylinder. 'All the rest' are rotated by hand (Sellers & Smith). Due to the lack of a solid production estimate, and the absence of serial numbers for this model in the Boulton database, no known survival rate is calculated.

PHOTOGRAPH BY RON PAXTON

Hooded Cylinder Pocket Revolver

This .28 caliber 6-shot revolver was made *circa* 1850 to 1853. It is considered the earliest production Whitney revolver, with about 200 made (Sellers & Smith). Several variations are known, reflecting changes that Whitney made in response to the Colt lawsuit during production. Due to the lack of a solid production estimate, and the absence of serial numbers for this model in the Boulton database, no known survival rate is calculated.

Whitney Two Trigger Pocket Revolver

Two Trigger Pocket Model. Brass frame, nickel plated. .32 caliber. SN 79. About 650 made. Jeff Goodson Collection
PHOTOGRAPH BY AUTHOR

This .32 caliber 5-shot revolver was made from about 1852 to 1854 with a manually rotated cylinder. The second trigger was designed to release and lock the cylinder (Flayderman). Total estimated production was about 650; 50 with iron frames and 600 with brass frames. Four were purchased by the Navy for trials in 1853 (Sellers & Smith).

The Boulton database records ten serial numbers for this model. Research has found examples bearing the same serial number (Williamson), however, raising questions about the validity of total production estimates. Because of that, and a short data collection period for this model, no known survival rate is calculated.

Whitney Ring Trigger Pocket Revolver

This .31 caliber 6-shot revolver, made from about 1854 to 1855, incorporated Whitney's first successful patent (#11,447) for a revolving cylinder. The gun was complicated, however, and had timing and mechanical issues. It was considered unfit for commercial use, and never produced in quantity.

Serial number data suggest that less than 50 were made. One of these, SN# 1—formerly in the William Locke Collection—sold in January 2020. Due to the lack of a more precise production estimate, no known survival rate is calculated.

Ring Trigger Pocket Model. .31 caliber. SN 1. Less than 50 made. Jeff Goodson Collection. Formerly part of William M. Locke Collection. PHOTOGRAPH BY AUTHOR

Whitney-Beals' Patent Pocket Revolver

PHOTOGRAPH BY RON PAXTON

The 'Walking Beam' was Whitney's first successful production model. Total production was about 3,200—including about 50 brass frame .31 caliber 6-shot guns; 2,300 iron frame .31 caliber 7-shot guns, and 850 .28 caliber guns (Flayderman). These production figures have been disputed (Sellers & Smith). While the Boulton database includes 19 serial numbers for this model, the collection period is too short to calculate a known survival rate.

Whitney Copy of Colt 1851 Navy

PHOTOGRAPH COURTESY OF COWAN'S AUCTIONS

This enigmatic model, almost an exact copy of Colt's Navy, was an unmarked, .36 caliber 6-shot revolver made about 1857. Ordered by the government as Whitney's version of the Colt Navy, the guns were rejected by the Ordnance Department in 1858.

While it's clear that the gun was *produced* by Whitney—it has the Whitney cylinder roll—it's unclear whether he manufactured them from scratch, refurbished existing Colts, or assembled them out of surplus Colt parts. The Chief of Ordnance reported that they were surplus Colt revolvers, but Whitney also made large numbers of 'good and serviceable' longarms during this period from surplus and condemned parts he obtained from the Springfield and Harpers Ferry arsenals and other sources (Flayderman).

Whitney claimed to have made 250-300 of the guns by the end of 1857. Serial number data support a total estimated production of 'slightly over 300' (Sellers & Smith), while Flayderman estimates total production at 300-400. Flayderman cites evidence that 'a majority of them may have been sold through a Texas agent to Mexico in the 1850s'. Most specimens, when they turn up, are therefore likely to be found in rough condition. One in fine condition, however, sold at auction in December 2019.

Due to the lack of evidence for a more precise production estimate, and the absence of serial numbers for this model in the Boulton database, no known survival rate is calculated. Given the Mexico history of the model, however, both its true survival rate and its appearance on the market should be very low.

Whitney Navy Revolvers

Photograph by Ron Paxton

This historically important Whitney firearm went into production immediately after Colt's patent expired in 1857. The .36 caliber, 6-shot solid frame revolver was made from 1857 to 1866, with total production estimated at 35,500—1,500 first models, and 34,000 second models (Williamson). The high serial number of 33,879 in the Boulton database supports Williamson's estimated production for the second model.

The Whitney Navy was one of the most widely used handguns in the Civil War. According to Williamson, the Army bought 10,587 from 1861-1864, including 7,602 under contract to Whitney and the balance on the open market. It was used by units in Colorado, Illinois, Kansas, Kentucky, Minnesota, New York, New Jersey, North Carolina, Ohio, Tennessee, Wisconsin and Illinois, and shipped as far afield as California and Louisiana (McAulay 1992).

The states of Maryland, New Jersey, Virginia, Ohio and Rhode Island also bought the model. At least 1,500 guns were shipped to Maryland and Virginia in 1860, and New Jersey bought about 920 in 1863 (Williamson). In addition, the Navy bought 6,276 Whitney Navy revolvers and issued them widely (McAulay 1992). Schiffers estimates that the federal and state governments bought 62% of Whitney's wartime production of the model, with the balance privately purchased—mostly by soldiers.

Quality was an issue in the survival of this gun. Garavaglia and Worman describe the Whitney Navy as a '...well-made, handy, and popular gun, although its construction was somewhat light for hard service.' They cite two officers of the 1st Colorado Cavalry who wrote that 'nearly every part except the barrel was subject to breakage, and the guns are not to be depended on.' The U.S. Navy also had quality issues with it. Inspector William Jeffers 'considered them inferior to all other revolvers then in service. The problem was with the check screw that retains the rammer...which doubled the time required to load the revolver' (McAulay 1999).

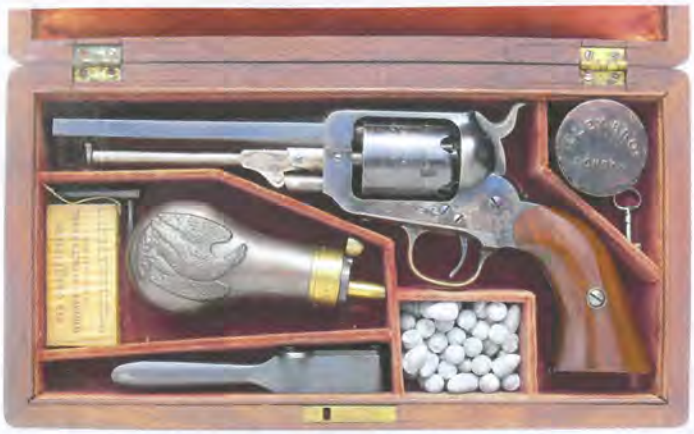
McAulay (1992) reports that of the 6,276 guns bought by the U.S. Navy, 3,923 (62.5%) survived the Civil War and were on hand in various Navy facilities as of December 1, 1866. He also reports that the Ordnance Department disposed of almost 1,300 surplus Whitney revolvers after the Civil War. Most were sold at Fort Monroe (1866), Washington Arsenal (1868), New York Arsenal (1883), and to Francis Bannerman (1901).

Years after the Civil War, large but unknown quantities of Whitney Navy revolvers were shipped overseas for use in the Franco-Prussian war (1870-1871). Subsequently, they were also used in the War of the Pacific (1879-1883) between Chile, Peru and Bolivia, where they still occasionally turn up today. Others bear London proof marks, and were used in Australia and other overseas colonies (Williamson).

One of the few researchers to systematically quantify survival rates, Fredrick R. Winter (1990), calculated that the survival rate for those Whitney Navy revolvers procured by the U.S. Navy was 2%. He attributes this low survival rate—vs. 'the more normal 4 to 5%'—to a high failure rate associated with a lack of '...systematic inspection procedures during the Civil War' (Winter).

The Boulton database included 939 serial numbers as of December 31, 2019, generating a known survival rate for this model of just 2.65% as of that date (Table 1). This number is well below the true survival rate, however, since specimens were added to the database at an average rate of 4.11% (34.3 guns) per year over the previous three years. With that many specimens remaining to be found, the known survival rate should rise significantly for the foreseeable future (Goodson and Boulton).

Whitney Pocket Model Percussion Revolver



Pocket Percussion Model. 2nd Model. .31 caliber. SN 9393. Cased with all accessories. Frank Graves Collection. PHOTOGRAPH BY FRANK GRAVES

At the same time that Whitney was making the Navy model revolvers, it was making .31 caliber 5-shot pocket revolvers along a parallel track (Sellers & Smith; Williamson). Total estimated production for this model was similar to the Navy, at about 32,500 for all types and variations (Flayderman). The high serial number of 32341 in the Boulton database supports this production estimate.

Although not a martial handgun, it sold heavily both before and during the Civil War. The Boulton database includes 404 pocket model revolvers, generating a known survival rate of 1.24% (Table 1). This number is also well below the true survival rate, since specimens were added to the database at an average rate of 3.55% (13.0 guns) per year over the previous three years. The known survival rate for this model should also rise significantly for the foreseeable future.

Whitney New Model Pocket (aka "Root") Revolver

New Model Pocket ("Root") Model. Whitney's answer to Colt's 1855 Root revolver. .28 caliber. SN 551. About 1,950 made. Jeff Goodson Collection. PHOTOGRAPH BY AUTHOR

Whitney's last percussion revolver was the New Model pocket or 'Root' revolver. Made from about 1860 to 1867, this .28 caliber 6-shot revolver was designed to compete with Colt's highly popular Model 1855 Root model.

Flayderman estimates total production at less than 2,000. The Boulton database registered 40 specimens as of December 31, 2019, and with a high serial number of 1931 we estimate total production at about 1,950 (Table 1). This generates a known survival rate of just 2.05%. This is a much closer approximation of this gun's true survival rate than for the previous two models. Only two new specimens were added to the Boulton database in the previous three years, increasing the number of known guns by just 1.76% per year. In short, very few unrecorded Whitney Root revolvers are showing up on the market (Goodson and Boulton).

MAJOR SURVIVAL RATE FACTORS

Adler estimates that 30,000 Whitney revolvers *of all types and calibers* were used in the Civil War, '...most of them purchased by civilians or individual soldiers.' And, as discussed above, large numbers of the Navy model were shipped to wars overseas well into the 1880s.

Both before and after the Civil War, Whitney revolvers were popular on the western frontier. San Antonio gun dealer Charles Hummel was an agent for Whitney in the mid-1850s, selling rifles, revolvers, breechloaders and carbines. 'His selection very probably embraced the manually rotated .31 caliber revolvers with solid frames of brass which Whitney made in the early 1850s.' In 1859, in Leavenworth, Kansas, John Biringer was also selling Whitney revolvers including the 'Whitney Colts Pattern' (Garavaglia and Worman).

After the Civil War, some discharged veterans brought their Whitney revolvers home (McAulay 1992). For those who remained in the service, along with Colts and Remingtons, '..a sprinkling of .44 Starrs and .36 Whitneys remained the hand weapons of the frontier cavalryman' (Worman). Some Whitneys were also documented in U.S. military inventories of percussion revolvers turned in by plains Indians in Montana in the late 1870s (Garavaglia and Worman).

CONCLUSIONS

This installment of *The Survival Files* reviews production data and rarity factors for the nine percussion revolvers produced by Eli Whitney, Jr. It proposes a total production estimate for the Copy of Colt's Navy of about 325, and based on the high serial number for the Root it refines the production estimate to about 1,950. The high serial numbers for both the Navy and Pocket Model support existing reported production numbers of 35,500 and 32,500, respectively (Williamson; Flayderman).

Table 1 Production and Survival Data The Whitney Percussion Revolvers

Whitney Percussion Revolver Model:	Prototype Hooded Cylinder	Prototype Hooded Cylinder Pocket	Two Trigger Pocket	Ring Trigger Pocket	Walking Beam	Copy of Colt '51 Navy	Navy & Eagle Co.	Pocket Model Percussion	New Model Pocket (aka "Root")
Flayderman ID:	5J-086.2	5J-086	5J-087 - 088	5J-089	5J-090 - 092	5J-093	5J-094 - 5J-103	5J-104 - 5J-112	5J-113
Years of Manufacture:	~1849-1850	~1850-1853	~1852-1854	~1854-1855	~1854-late 1860s	~1857-1858	1857-1866	Late 1850s-early 1860s	~1860-1867
Caliber:	.36	.28	.32	.31	.31 and .28	.36	.36	.31	.28
SURVIVAL DATA (as of January 1, 2020)									
Total Estimated Production (TEP):	**Very Limited/Rare**	**~200**	**~650**	**under 50**	**~3,200**	**~325**	**35,500**	**~32,500**	**~1,950**
Total Recorded in Database:							939	404	40
Highest SN in Database:							**33,879**	**32,341**	**1,931**
Lowest SN in Database:							5	2	85
Known Survival Rate (KSR):							**2.65%**	**1.24%**	**2.05%**
DATA STABILITY (as of January 1, 2020)									
# Recorded, January 2017 to December 2019:							104	38	2
Avg. #/yr Recorded (last 3 years):							34.33	13.00	0.67
Stability Index (%/year increase over base year):							**4.11%**	**3.55%**	**1.76%**

Red Cells: Key data, referenced in text.

Shaded Cells: KSR and Stability Index not calculated due to very low TEP, imprecise TEP data, and/or limited data collection period. See text for individual models.

Data Sources: All base numbers are from Philip Boulton Database except TEP data from Flayderman (9th edition) and Navy data from Williamson (2012).

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COPY OF COLT NAVY: TEP datum from Sellers & Smith who cite TEP at "slightly over 300."

NAVY: High observed SN of 33,879 supports Williamson's figure of 34,000 for second model (+ his figure of 1,500 first model guns). Six guns in the Boulton database are included in the totals, but not used for reporting the high serial number because of probable transposition or mis-recording of numbers. These are SNs 35718, 36322, 36837, 38647, 56710 and 69680. Readers/collectors with knowledge of these six guns are requested to contact Boulton directly.

POCKET MODEL PERCUSSION: We use Flayderman's TEP of ~32,500 for this model. Three guns in the Boulton data base are included in the totals, but not for reporting the high serial number because of probable transposition or mis-recording of numbers, or other reasons: SNs 63611, 64481 and 83896. Readers/collectors with knowledge of these three guns are requested to contact Boulton directly.

NEW MODEL POCKET AKA "ROOT": Flayderman gives a TEP of "under 2000." Based on 40 guns recorded, and a high SN of 1931, we estimate total production at ~1950.

Known survival rates as of January 1, 2020 for the final three Whitney models produced are calculated. All three models saw extensive use before, during and after the Civil War, on the western frontier and—at least for the Navy model—in overseas wars. The known survival rates for the Navy (2.65%) and Pocket (1.24%) will climb significantly; the number of specimens in the Boulton database is growing at a rate of 4.11% and 3.55% per year, respectively. The known survival rate for the Whitney Root (2.05%) is much closer the true survival rate of the model. It will grow much more slowly, as the rate that new specimens came to light grew at an average rate of just 1.76% per year over the last three years.

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