

The Manufacture of Confederate Ordnance in Georgia

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The American Civil War, like all wars, was a test of men and the will of men to determine whose will would dominate. The Civil War provided yet another test—that of logistics, which has become of the utmost importance as the strategy of the war has advanced. Logistics is the capacity of any warring nation to provide the necessities of life and the tools of war to her fighting men. It was in meeting this test that the Confederacy received one of her lowest marks. It was not a lack of effort that caused the greatest problem, but, rather, the poor industrial system which resulted from a lack of trained men, machinery and production capacity. This forced the South to build her war effort upon a weak foundation. Despite these many obstacles, the Confederacy did a remarkable job in maintaining her fighting forces in the field until the forces themselves were no more. A study of this portion of the overall Confederate effort and, more particularly the role of Georgia, has been made very difficult by the lack of records, especially ordnance reports and the sketchy information in those that survived.

It would be hard to find a state equal to Georgia in her total war effort and valiant attempt to supply fighting men in the field. There are several major reasons for Georgia's leadership in this area. The initial supply of captured arms was quickly issued and the blockade made importation increasingly difficult; thus, forcing the Confederacy to look to her own inadequate production facilities to supply her needs. At the outbreak of the war, Georgia was third in the Confederacy next to Tennessee and Virginia, in the number of existing industrial establishments, with 1,890. This figure would seem impressive until one investigates its composition and finds one of the first weaknesses in the South's shaky industrial foundation. Of these 1,890 industrial establishments, the following breakdown is given in order of importance as to the dollar volume of production:

Grain Milling	378 Establishments \$4.5 Million
Lumber	410 Establishments \$2.4 Million
Cotton	33 Establishments \$2.3 Million

In order of importance comes boot and shoe manufacturing, carriage and wagon making, leather finishing, blacksmithing, turpentine, furniture, wood, and, unfortunately, last the production of iron. This, then, is the face of an agricultural economy.¹

In support of its industry, Georgia was second only to Virginia in railroad mileage, with 1,404 miles and 18 railroad companies by the Year 1860.² These rail lines were the keystone of the interior lines of communication for the Confederacy. From its central location, Georgia could ship goods to armies in Virginia, Tennessee, or the trans-Mississippi region.

Another of Georgia's major advantages which grew more apparent during the first year of the war was her relative remoteness from the actual fighting until late in the spring of 1864, when General Sherman began his Atlanta Campaign. Until that time, all military activity was confined to either the coast or the northern section of the State bordering on Alabama and Tennessee. The Federal forces captured Fort Pulaski in April of 1862, sealing off Savannah from the sea. Although the necessary collection of troops in and around Savannah for its defense gave the Federal forces an almost free run of the Georgia coast, no serious penetration inland was ever made. The famous Andrew's Raid was an attempt to cut the Western and Atlantic Railroad to Chattanooga in April, 1862, but with Andrew's capture, failed. One year later, Colonel Straight with the 51st Indiana Volunteers was foiled by General Nathan Bedford Forrest in his attempt to cut the same railroad just south of Dalton. Finally, the indecisive Battle of Chickamauga was fought in September of 1863, with the Union forces retreating to Chattanooga for the winter.³

Efforts to escape the war brought many arms makers and suppliers, both private and governmental, to the state. The more important immigrants were: Cook & Brothers from New Orleans; Leech & Rigdon from Mississippi; Dickson & Nelson from Alabama. The machinery from the Baton Rouge arsenal and from Nashville was also brought to Georgia. Colonel George Washington Rains

sums up many of Georgia's advantages in giving his reasons for selecting Augusta, Georgia as the site for the Confederate powder works. These were: central location, water power, railroad facilities and security from attack.⁴

Georgia's war effort, like that of most southern states, was one of total involvement, as every segment of each individual's life was affected by the tremendous demands and hardships created by the conflict. For the most part, in every section of the state manufacture for civilian use was replaced by that for war-time purposes. Women made clothes for the local units, and plantation owners organized small production groups to make shoes, hats, and other necessary items. A firm in Washington, Georgia made waterproof oilcloth overcoats, cap boxes, and leggings and all 125 boot and shoe factories were turning out their wares at maximum capacity.⁵ Another firm in Dalton was making cartouche boxes, swords, knapsacks, canteens, cloth and shoes and the largest paper mill in the state located at Marietta made paper for cartridges.⁶ The majority of the war-time production activity, however, was conducted in Atlanta, Athens, Augusta, Columbus and Macon.

Augusta is a good example of the activity required to support the various fighting forces. This city held a particularly important position because, in addition to her extensive arsenal and the private facilities in operation, the Confederate Powder Works was located there. Both the arsenal and powder works were under the able command of Colonel George Washington Rains, a native of North Carolina, graduate of West Point where he taught chemistry and geology, and later head of the large Washington Iron Works in Newbury, New York. At the outbreak of the war, Colonel Rains' theoretical and practical background made him an excellent choice to run this vast complex.

The powder works, which stretched for two and a half miles along the Augusta canal, was a remarkable accomplishment in that it was in operation by April of 1862, and was built almost entirely after the commencement of the hostilities.⁷ Colonel Rains chose G. Shaler Smith as architect for the powder works, who used granite from Stone Mountain, the present-day Confederate Memorial, for his buildings.⁸ A booklet on the Watham Abby Works in England, one of the most advanced powder producing facilities in the world at the outbreak of the Civil War, provided the overall plans for the facility.⁹ The tremendous amount of machinery

required for the works was collected from all over the Confederacy. Some machinery was removed from Nashville, Tennessee before its capture, and the Tredegar Iron Works made much of the large equipment necessary in the manufacturing process of powder, such as the five-ton rollers used to granulate the mixture.²⁹

From April, 1862 to April, 1865, the powder works at Augusta produced an average of 7000 pounds of powder daily for a total production of approximately 2,750,000 pounds of powder. Moreover, the powder made there was of first quality, as testified by the fact that it was used after the war by the U. S. Army at its artillery school at Fortress Monroe, Virginia.³⁰

The Augusta arsenal was second only to Richmond in the production of small arms and field artillery ammunition. The arsenal's daily production was approximately 20,000-30,000 rounds of small arms ammunition and 125-150 rounds of field artillery ammunition.³¹

Wherever an arsenal was located became the center of the majority of the war effort in that vicinity. In addition to its own production, the Augusta arsenal had to contract for and inspect many additional items. For example, the firm of Jessup, Hatch and Day produced most of the artillery harness for the arsenal and S. S. Jones & Company made 10,000 buckles for military use per week, canteens, camp utensils, leather bayonet scabbards mounted with copper and leather artillery buckets.³²

Private industry in Augusta also made uniforms, tents, blankets, knapsacks, haversacks, saddles, flags, and oilcloth from the cloth of the Augusta factory, the second largest textile mill in the Confederacy.³³ The Augusta arsenal itself, with Professor P. B. Wilson as its chief chemist, produced, in addition to the small arms and field artillery ammunition heretofore mentioned, signal rockets, time fuse, friction primers, percussion caps and hand grenades.³⁴

As another part of the arsenal activity, the Augusta Machine Works made approximately 110 brass twelve-pound Napoleons complete with carriages and a number of cassons, battery wagons, traveling forges and limbers.³⁵

The Confederate government established its Naval Quartermaster Division which contracted primarily for uniforms and shoes in Augusta. The Naval Ordnance Department also moved to Augusta with the fall of Atlanta in June of 1864. The firm of Mulliken and Harrell produced shot, shells, gun cartridges, and other items of ordnance equipment for vessels for the Naval Ordnance Depart-

ment until the end of the war. The Confederate Clothing Bureau and the Confederate States Shoe Manufactory were established under Major Lemuel O. Bridwell. The state of Georgia also had its clothing bureau in Augusta.¹⁷

Possibly the best known arms producer in Augusta were the pistol makers, Rigdon and Ansley. This firm first came to Greensboro, Georgia in March, 1863, from Columbus, Mississippi. The firm then had the name of Leech & Rigdon of Memphis Novelty Works fame. After a year's production at Greensboro where close to 1,400 revolvers were made, the partnership of Leech & Rigdon was dissolved. Charles Rigdon moved to Augusta and opened the pistol making firm known as Rigdon & Ansley. The new firm continued the government contract of Leech & Rigdon, making the famous twelve-stop revolver until January, 1865. While in Augusta, approximately 1,000 pistols were made.¹⁸

Augusta's contribution to the War effort can best be illustrated by a summary of Colonel Rains' official production reports to Colonel Gorgas, Chief of Ordnance for the years 1863 and 1864.¹⁹

174	Gun Carriages
115	Caissons
343	Limbers to Field Artillery
21	Battery Wagons
31	Travelling Forges
10,535	Powder Boxes
11,811	Boxes for Small Arm Ammunition
73,521	Horse Shoes
12,630	Nitric Acid, pounds of
2,227	Ounces of Fulminate of Mercury
2,455	Saddles, complete
2,535	Artillery Harness, single sets of
2,477	Signal Rockets
85,800	Rounds of Fixed Ammunition
136,642	Artillery Cartridge Bags
200,113	Time Fuses
476,207	Pounds of Artillery Projectiles
4,580,000	Buckshot
4,626,000	Lead Balls
1,000,000	Percussion Caps
10,760,000	Cartridge for small arms

Augusta continued to produce small materials until its capture at the end of the war.

Cook & Brothers, located at Athens, Georgia, made rifles, carbines, short rifles, bayonets and sabres, all modeled after the British Enfield designs. This firm moved to Athens in the spring of 1862, when New Orleans, its first location, fell. It was run by two Englishmen: Francis Cook, a former architect, and Ferdinand Cook, a former engineer. The firm employed at different times between two and five-hundred men, and produced roughly three-hundred stands of arms monthly under a government contract for thirty thousand.²⁰

Colonel James H. Burton, Superintendent of Confederate Armories, wrote in his diary that he found Cook & Brothers to be "the best fitted up and regulated private armory I have yet inspected in the Confederate States."²¹ During July and August, 1864, no payments were made for the work done by Cook & Brothers' armory; hence, making it necessary for this model private armory to cease operations.²²

Rome, Georgia was the home of Noble Brothers and the Shakanooosa Arms Company for a short period of time. Noble Brothers was the only private foundry in Georgia casting cannon. They produced a wide variety, as evidenced by the following pieces which have been found: three-inch rifle, 4.2-inch smooth bore; six-pound field piece; and a twelve-pound Napoleon.²³ The government had a contract with them for field pieces and a hydraulic bullet press designed to turn out seventy rounds per minute.²⁴

The Shakanooosa Arms Company was managed by William Dickson, Owen O. Nelson, and Dr. Lewis Saddler, who made the Dickson and Nelson arms for the state of Alabama of the Mississippi model. This firm first operated in Dickson, Alabama, but the tides of war caused it to move to Rome, Georgia, where it was located until it burned a few months later. It then moved to Adairsville, Georgia, and then to Dawson. Its contract with the state of Alabama was never fulfilled and only 645 arms were produced.²⁵

The Georgia State Armory was located at Milledgeville in the State Penitentiary and was reported to be producing about 125 rifles per month.²⁶ The better portion of the machinery for the armory was made by Peter Jones, head armorer at Harper's Ferry for eighteen years. The armory itself was under the command of Major McIntosh. In addition to the "Georgia rifles," the armory made sword bayonets, muskets, and swords.²⁷ Judging by the num-

ber of specimens still in existence there must have been many more sword bayonets made than the other items mentioned. It was also at the state armory that from March through September, 1862, the state received 12,000 pikes with six-foot staffs and eighteen-inch blades which had been ordered by Georgia's war-time Governor Joe Brown; hence, the name Joe Brown pikes. Pikes were sent to Augusta, Savannah and Chattanooga.²⁸

Macon, Georgia, like Augusta, Columbus and Atlanta, was another center of war activity. The Macon arsenal, under the command of Captain R. M. Cuyler, was moved to Macon in April of 1862, from Savannah after the fall of Fort Pulaski, which severely lessened the security of that city.²⁹ The government arsenal took over the facilities of D. C. Hodgkins and Sons, and the Findlay Iron Works. Hodgkins, having made one-hundred carbines based on the U. S. Model 1855, and \$100,000 worth of small arms ammunition, and converted 2,000 flint locks to percussion for the state of Georgia, was already in the arms business. Hodgkins also made stock mountings, surgical instruments and cotton goods.³⁰

At the Findlay Iron Works, the government made approximately 70 Napoleons and twenty-pound Parrott guns; also projectiles, saddles, harnesses and other leather products.³¹ The output of the Macon arsenal was approximately 10,000 rounds of small arms daily and 100 to 125 rounds for field artillery.³² The Macon arsenal also had many private contractors working under its jurisdiction. Some of these were Schofield Brothers, whose foundry made cannon projectiles; Isaac Scott, who made tent cloth; Smith and Little, who made artillery harnesses, cavalry saddles, bridles, sword belts and knapsacks; Smith & Clyborn, who made artillery harnesses, saddles, leggings, sword belts and knapsacks; and, Woodard Company, who made camp cots, camp stools, tents and button molds.³³

The Confederate Central Laboratory, second only to Richmond, was established in Macon by Lt. John William Mallett. Lt. Mallett was a native of Ireland and had earned his doctorate degree in chemistry, and held the chair of chemistry at the University of Alabama at the outbreak of the war. Mallett's job at the Confederate Central Laboratory included standardization of the production of ammunition as to caliber and quality; experimentation with projectiles, rockets and powders. He also supervised the production of percussion caps, friction primers and other pieces of ordnance. It must be said that Lt. Mallett was quite successful in his endeavors,

both in badly needed standardization and experimentation. One particular fruit of his labor was the polyganal shell which he invented.²⁴

Also located in Macon was the Confederate armory under the command of Col. James Henry Burton. Prior to the war, Col. Burton had been master armorer at Harper's Ferry until 1855 when he went to England to become chief engineer at the Enfield Royal Small Arms Factory, a position he held until the outbreak of the war, at which time he offered his services to the Confederacy.²⁵ Colonel Burton was given the title of Superintendent of Armories. For the most part, the activity at the armory was limited to the repairing of arms and the manufacture of gun stocks for the Richmond arsenal on the machinery captured at Harper's Ferry.²⁶ The only guns manufactured at the armory were pistols made on the machinery purchased from the pistol making firm of Spiller and Burr, which became delinquent in deliveries on their government contract. This machinery was moved from Atlanta to Macon. Approximately 689 of these pistols were made in Macon between February, 1864, and December, 1864, when a portion of the pistol making equipment was sent to Columbia, South Carolina for fear of capture by Sherman.²⁷

Col. Burton had hoped to establish at Macon an armory which produced Enfields such as the one he had been in charge of in England. In order to house the necessary machinery, Col. Burton began to build several large buildings, the largest of which was 45-foot wide, and 620-foot long, and two stories high, which was completed by the end of the war.²⁸ He went to England in the spring of 1863 and made a contract with Greenwood and Battery of Leeds through Frazer, Trenholm and Company of Liverpool for the Enfield machinery. Col. Burton returned home in November of that year to complete the necessary facilities for his new equipment. When the war ended, one-sixth of the machinery had either reached the Confederacy or had been captured, and the rest was either in England, Nassau or Bermuda.²⁹

Also operating in Macon was W. J. McElroy and Company who were tinsmiths prior to the war. They turned over their shop to the Confederate government, who used it to make canteens. W. J. McElroy and Company then went into the sword business.³⁰ Another firm of note operating in this field was E. J. Johnson Company who made infantry, cavalry and artillery swords with belts and mountings. Both

of these firm's products were of relatively high quality, and were very similar to each other in design and appearance. McElroy also was supposed to have made the familiar frame buckles for the Confederate enlisted men.

About ten miles southeast of Macon was Griswoldville, where the firm of Samuel Griswold and A. W. Gunnison made cotton gins. Although Sam Griswold was a native of Connecticut, he was extremely loyal to his new found home. With the outbreak of the war, he made the famous cavalry pikes for the state of Georgia. In 1862, he received a contract from the Confederate government to make revolvers. He manufactured the now famous brass-framed revolvers until the factory was destroyed by Union cavalry in November of 1864. Approximately 3,600 revolvers were produced; more than any other producer in the Confederacy. It might be noted here that the revolvers are referred to in the official Confederate ordnance reports as Griswold and Gunnison, not Griswold and Grier, as some have called them. E. C. Grier was Samuel Griswold's son-in-law and may have had something to do with the firm, but was not a principal.⁴¹

General Gorgas referred to Columbus, Georgia as "the nucleus of our ordnance establishment".⁴² At the outbreak of the war, Columbus, in addition to having rail facilities, was also a river town with over 62 boats plying the river between Columbus and the Gulf. The firms already established by Columbus' 10,000 inhabitants formed the backbone of her war effort. The Columbus Factory provided shoes and uniforms; the Eagle Manufacturing Company was one of the largest in the South providing uniforms, tents, knapsacks and shirts; Rock Island Paper Mill supplied large quantities for Army use; Golbeck made buttons with the Georgia seal; DeWitt made swords, but soon turned over their facilities to Greenwood and Gray for the manufacture of arms; Barringer and Morten converted their lumber yard and sawmill to produce gun carriages; S. M. Sappington became the largest shoe manufacturer in the South.⁴³ Cadman made military belts and Brands and Korner made oilcloth and belts, as well as cartridge boxes.⁴⁴

The above mentioned firms were just a small part of the activity of Columbus, whose population by 1863 had increased to 15,000 people. The Columbus Iron Works, a manufacturer which had made twelve-pound Napoleons, mortars and wrought iron rifled cannon for the Ordnance Department, was leased by the C. S. Navy in June of 1862.⁴⁵ It was placed under the command of Major James

H. Warner who was former chief engineer at the U. S. Naval Yard at Gosport, Virginia.⁴⁹ The Naval iron works, as it was now called, had three major tasks: casting cannon; making steamship boilers; and constructing gunboats. There were roughly 70 Napoleons and three ships made at the Columbus Iron Works. The wooden gun boat "Chattahoochee" was launched early in 1864, but was scuttled by its crew to avoid capture by Wilson's raid in April, 1865. The gunboat "Muscogee" and the armored ram "Jackson" carrying six seven-inch guns was still on the ways, never being completed; mainly because of lack of materials. Both of these were destroyed by Wilson's men when they captured the city.⁵⁰ Because of lack of materials, the Naval Gun Works ceased operation for the most part by the winter of 1865.

Captain F. C. Humphreys of the Ordnance Department took command of the C. S. arsenal in June 1862, when the Army transferred to their own arsenal in Columbus after the Navy leased the Columbus Iron Works. The arsenal made harnesses, ordnance material and infantry accoutrements on the machinery moved from Baton Rouge, Louisiana in the spring of 1862.⁵¹ The arsenal also produced daily 10,000 rounds of small arms, and 75 to 100 rounds of artillery shells, as well as knapsacks. In addition, under Captain, later Major, Humphrey's command was a government wagon-making establishment producing thirty wagons a month.⁵²

In July of 1864, Colonel M. H. Wright moved the entire Atlanta arsenal to Columbus to avoid capture by Sherman, making Columbus truly a center of war production.⁵³

All of the actual arms manufacturing in Columbus remained in private hands, but under close government direction. The firm of Greenwood and Gray was the largest arms maker, producing rifles and cavalry carbines. The partners in this firm, Eldridge S. Greenwood and William C. Gray, were in the cotton warehouse business prior to the war, and were the financial backing for J. P. Murray, the chief armorer of their arms making enterprises. Murray's name appears on the arms. Many guns were sold to the state of Alabama.⁵⁴ Louis Haiman and his brother, Elias, formed the firm of Haiman Brothers which became the largest sword producer in the Confederacy. By 1863, they employed 400 workers and were producing 250 swords and cutlasses per day.⁵⁵ The firm also produced buckles, belts, camp equipment, cartridge boxes, mountings for bayonet scabbards, satchels, haversacks and bayonets for double-barrel shotguns.⁵⁶

Haiman Brothers formed the Columbus Firearms Manufacturing Company to supply a contract for the Government for 10,000 Navy revolvers on the Colt pattern.⁵⁵ The firm did not produce over 100 before it was sold to the Confederate government. The war ended just before production under government control began. General Wilson, in one of his reports after the capture of Columbus, said of the Columbus Firearms Manufacturing Company, "this enterprise repaired small arms, made locks, and was about ready to commence making revolvers similar to the Colt army".⁵⁶

Judging by the scarcity of these arms, the figure of approximately 100 produced seems reasonable. An evaluation of Columbus' importance to the Confederacy can be drawn from the report of General Wilson regarding the material and facilities destroyed when he captured the city in April of 1865. General Wilson reported 125,000 bales of cotton, 20,000 sacks of corn, 15 locomotives, 250 freight cars, machine shops, round houses, railway supplies, naval armory and shipyard, two rolling mills, Confederate arsenal and nitre works, two powder magazines, two iron works, three foundries, ten mills, factories in cloth, paper, guns, pistols, swords, shoes, wagons, 100,000 rounds of artillery, and immense quantities of small arms and accoutrements were either captured or destroyed.⁵⁷ The capture of Columbus was a blow to both the Union and the Confederacy because when General Wilson destroyed large sections of the city, the war was already over; therefore, the cotton, etc., he destroyed actually belonged to the Union.

Being the headquarters for the lower South for the Confederate Quartermaster and Commissary Departments, Atlanta was the center of supply for the Army of Tennessee. The Atlanta arsenal consisted of thirteen buildings.⁵⁸ This included military storehouses, armory and machine shops, finishing department, laboratory and pyrotechnical department, percussion cap forming, harness and saddle shop, and seven buildings for the laboratory and magazines.⁵⁹ Cartridges, percussion caps, friction primers, gun supplies, knapsacks, saddles, artillery ammunition, buttons, spurs, bridles, buckles, cannons, armor plate and rolling stock were produced in Atlanta.⁶⁰ Colonel Marcus Wright commanded the arsenal at Atlanta and attained a daily production rate of approximately 25,000 small arm cartridges and 125-150 projectiles for field artillery.⁶¹

The record of receipts and issues at the Atlanta Armory for 1863 and 1864 gives some idea of the type of activity carried on in At-

lanta. Twelve-pound Napoleons were received from Noble Brothers in Rome and from the Macon arsenal. The Georgia Railroad shop produced 2.25-inch bronze breech loading rifles. A firm in Cowetta County had a contract to make 1,000 canteens.⁶² Some of these could possibly have been some received at the armory in a shipment of 4,209 tin canteens, 972 cedar canteens, and 795 cypress canteens. The armory also received and shipped belt plates by Minchner, who was believed to have made the CSA cast brass buckle, web-belts and plates, saber belts, gun slings, 69-caliber ball cartridges and 58-caliber cartridges. With private firms producing a great deal of the goods, the armory also produced its share as evidenced by the entry received from the harness shops—503 webb belts—and from the tin shop—1,592 tin canteens.⁶³

The firm of Spiller and Burr had a contract with the Confederate government for 15,000 Navy-type revolvers. The firm was bought by the government in January of 1864, because they had fallen behind in their contract. The government then moved it to Macon.⁶⁴ At present, it is believed that, with the exception of Spiller and Burr, there were no other arms produced in Atlanta; however, both the conversion and the repair of guns were carried out there.

Colonel Wright moved the bulk of the Atlanta armory to Columbus in the summer of 1864, prior to its capture by Sherman. The city itself was destroyed by the Union forces prior to commencing their famous March to the Sea.

Compared to modern standards, Georgia's arms production effort may be small, but what she did manage to accomplish with the limited resources and facilities at hand was a feat requiring the great dedication and perseverance of all involved. It is only hoped that these qualities which made this country great will not be lost to the materialistic struggle of our times.

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NOTES

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- ³ *Ibid.*, pp. 70-76.
- ⁴ Colonel George W. Rains, *History of the Confederate Powder Works*, (Augusta, Georgia, 1882), p. 4.
- ⁵ Bryan, p. 27.
- ⁶ *Ibid.*, pp. 103-107.
- ⁷ Florence Corley, *Augusta, Georgia, 1860-1865*, (Columbia, South Carolina, 1960), pp. 50-57.
- ⁸ Rains, p. 12.
- ⁹ *Ibid.*, p. 8.
- ¹⁰ Corley, p. 56.
- ¹¹ *Ibid.*, p. 59.
- ¹² Frank E. Vandiver, *Ploughshares into Swords*, (Austin, Texas, 1952), p. 82.
- ¹³ Corley, p. 47.
- ¹⁴ *Ibid.*, pp. 46-47.
- ¹⁵ *Ibid.*, p. 50.
- ¹⁶ Rains, p. 30.
- ¹⁷ Corley, pp. 48-50.
- ¹⁸ Claude E. Fuller and Richard Stewart, *Firearms of the Confederacy*, (Huntington, West Virginia, 1944), pp. 267-270.
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- ²⁰ William A. Albaugh & Edward Simmons, *Confederate Arms*, (Harrisburg, Pa., 1957), p. 212.
- ²¹ Vandiver, p. 232.
- ²² *Ibid.*, p. 222.
- ²³ Albaugh and Simmons, p. 250.
- ²⁴ Bryan, p. 24.
- ²⁵ Albaugh and Simmons, p. 250.
- ²⁶ Allen D. Candler, Ed., *The Confederate Records of the State of Georgia*, (Atlanta, Georgia, 1909-1911), Vol. II, pp. 56, 57, 109, 365, Vol. III, p. 90.
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- ²⁹ Ida Young, Julius Gholsen, and Clara Hargrove, *History of Macon, Georgia*, (Macon, Georgia, 1950), p. 218.
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- ³¹ James C. Hazlett, M.D., "The Confederate Gun," *Journal of the Company of Military Historians*, Vol. XVI, No. 4, Winter of 1864, (Washington, D. C., 1964), p. 104.
- ³² Vandiver, p. 148.
- ³³ Albaugh and Simmons, pp. 260, 263, 276.
- ³⁴ Otto Eisenshimel, *Chemical and Engineering News*, Vol. 29, June 8, 1951, pp. 110-111.
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- ³⁷ *Ibid.*, pp. 60-82.
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- ⁴⁰ Albaugh, p. 7.
- ⁴¹ *Ibid.*, pp. 1-17.

- ⁴⁷ Vandiver, *Ploughshares into Swords*, p. 61.
- ⁴⁸ Duffee William Standard, *Columbus, Georgia in the Confederacy*, (New York, 1954), pp. 14-32.
- ⁴⁹ Albaugh and Simmons, p. 204.
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- ⁵¹ Etta Worsley, *Columbus on the Chattahoochee*, (Columbus, Georgia, 1854), pp. 203-205.
- ⁵² Standard, pp. 43-44.
- ⁵³ *Official Records of the Union and Confederate Armies*, Series IV, Vol. 1, p. 620.
- ⁵⁴ Vandiver, p. 148.
- ⁵⁵ Standard, p. 31.
- ⁵⁶ *Official Records of the Union and Confederate Armies*, Series I, Vol. 81, IV, p. 406.
- ⁵⁷ Albaugh and Simmons, p. 275.
- ⁵⁸ Standard, pp. 39-40.
- ⁵⁹ Albaugh and Simmons, p. 226.
- ⁶⁰ *Ibid.*, p. 211.
- ⁶¹ Fuller and Stewart, p. 318.
- ⁶² Worsley, pp. 296-290.
- ⁶³ Bryan, p. 102.
- ⁶⁴ Albaugh, p. 42.
- ⁶⁵ Bryan, p. 102.
- ⁶⁶ Vandiver, p. 148.
- ⁶⁷ Bryan, p. 24.
- ⁶⁸ *Record of Receipts and Issues at the Atlanta Armory, December 1863, June 1864*, Chapter IV, Vols. 17-18, National Archives Record Group 109.
- ⁶⁹ Albaugh, pp. 31-34.