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Napoleon: Apex of the Military Revolution

Patrick S. Baker

Without a doubt, Napoleon was a great general. Even his enemies thought so; the Duke of Wellington once famously remarked that Napoleon's presence on the battlefield was worth an extra forty-thousand men.¹ However, his prominence was not limited to the military arena. He revised the legal, tax, education systems and civil administration of France and several other European nations. In short, Napoleon was the colossus that stood astride his times.² However, some have suggested that while he was great field commander, Napoleon was no great innovator in military affairs, neither tactically, strategically nor technically.³ Rather, he was the mere beneficiary of the innovations of others.⁴

This article will discuss "The Military Revolution" in Western Europe and will analyze how Napoleon became the apotheosis of this "Revolution" by creating, managing and organizing the most devastating and successful army to that point in history. Napoleon and *Le Grande Armee* became the models for all other generals and armies for the next two hundred years and capped the Military Revolution.

The Military Revolution Defined

Napoleon was the beneficiary of a three-hundred-year-long progression in military affairs often called the Military Revolution. However, the term "revolution" is something of a misnomer as the process of military innovation encompassed by the Military Revolution actually fits the model of "punctuated equilibrium evolution" rather than a single distinct and rapid revolution. That is to say,

“The Military Revolution” was actually a “series of intense revolutionary episodes, each built on a more extended base of slow evolutionary change.”⁵ However, the term, “the Military Revolution” is still useful shorthand in describing and delineating the process of advancement in military affairs within the three-hundred year time frame between 1500 to 1800.

The Military Revolution was not spread uniformly throughout Europe in either time or space. The great leap forward in military affairs that may be conveniently defined using the term revolution started in France, the Low Countries, the northern Holy Roman Empire and Northern Italy around 1500, spread into the British Isles by around 1700 and then into Russia and the Balkans by about 1800.⁶ Napoleon fought most of his wars in the areas where this great leap forward in military affairs started and continued the longest. That the Emperor took advantage of developments of this “revolution” is therefore not surprising.

The major components of the Military Revolution were a massive increase in the destructive power of armies through the development and use of gunpowder weapons and the construction of colossal fortifications designed to resist those gunpowder weapons. There were also advances in tactics and strategy to make better use of this destructive power. Lastly, there was a huge increase in the size of standing armies with corresponding advances in training, professionalism, administration, and bureaucracy to manage these new military organizations.⁷

Military development in Europe was coming to the end of a period of slow, evolutionary change as Napoleon graduated from the relatively new French Military Academy; the *Ecole Militaire*. In much of Western Europe, this was the era of small wars fought for limited objectives. The concept of limited wars was strongly defended by many crowned heads in Europe, such as Prussia’s Fredrick the

Great. Fredrick said in 1775: “The ambitious ought never to forget that arms and military discipline are much the same throughout Europe... And policy has established a certain balance of power... [and that] great enterprises rarely produce such effects as might be expected.”⁸

However, the limited and rather gentlemanly “cabinet wars” of the early and middle years of eighteenth century were soon superseded by the *levee en masse* of 1793 and the advent of what became known as “National War” on yet another of the “intense revolutionary episodes” in the overall Military Revolution.⁹ Thus, as Napoleon rose through the military hierarchy to become First Consul of the French Republic in 1799 and then Emperor of the French in 1804, he was poised to benefit from this latest development in the Military Revolution as he set about the task of creating a vast and ruthlessly efficient war machine.

Fiery Weapons

By Napoleon’s time, gunpowder weapons almost completely dominated the battlefields of Europe. After all, even the bayonet was attached at the end of a musket and cavalry was at least partly armed with short carbines and pistols. The dominance of gunpowder weapons had been slow in coming since the introduction of gunpowder into Western Europe in the middle of the 1300s. However, since that introduction, both artillery and infantry gunpowder weapons pursued parallel paths of development, in that each type of weaponry increased in power, range, numbers and mobility.

Tracing the development of gunpowder weapons in Europe may start with the first mention of handheld guns in a 1364 inventory of an arsenal in Italy. This armory had: “500 bombards . . . held in the hand . . . able to pierce any armor.”¹⁰ These hand-cannons were often mounted or rested on wooden frames and were set off by a

slow burning match held to a drilled touchhole. They fired lead balls, properly sized stones or metal arrows called bolts. Most of these “hand gonnies” had to be moved and fired by two-man teams. By the middle of the fifteenth century, the size of hand weapons had been reduced so that they could be held and fired by one man from the shoulder.¹¹ Despite these advances, in the middle 1400s even the most forward looking rulers, such as Duke Charles the Bold of Burgundy, still trusted in bowmen more than in gunmen during battle.¹²

The initial innovation which inspired confident use of firearms in battle was the invention of the matchlock. In a matchlock, a slow match was held in a clamp at the end of an S-shaped piece of metal -- called the lock -- and then lowered to the touchhole by pulling a trigger. The matchlock was so unwieldy that a balancing rod designed to hold the barrel of the gun had to be used to fire the weapon. From the late 1400s to the late 1600s it was the matchlock that came to dominate the battlefields of Europe, ultimately supplanting the longbow and crossbow as the primary long-range infantry weapon.¹³ The infantry firearm still had several disadvantages versus the longbow or crossbow, though, including a slower rate of fire, significantly shorter range and less stopping power. Despite these enduring disadvantages, firearms had one great advantage over bows: they could be mastered with virtually no training, whereas a longbow or a crossbow took years to learn how to use effectively.¹⁴ By the time of the English Civil Wars fought between 1642 and 1651, the matchlock had gotten shorter and lighter, negating the need for the balancing rod and making the firearm much more maneuverable. However, the slow rate of fire for the matchlock still required that they be protected by pikes, with a ratio of two guns to five pikes, by 1691 that ratio had dropped to two guns to one pike.¹⁵

The next development in infantry arms was the flintlock mus-

ket. By the 1690s the flintlock musket with the plug bayonet was used to equip elite units such as King William III's Dutch Guards at the Battle of the Boyne in 1690.¹⁶ The problem with the plug bayonet was that soldiers could not fire their weapons while the bayonet was in place. In ten years, plug bayonets were "universally replaced" by the ring bayonet.¹⁷ The ring bayonet allowed the musket to fire with the blade affixed. Therefore, by 1700 the development of the bayonet had finally banished the pike from the battlefield and completed the shift from bladed pole arms to gunpowder weapons for the foot soldier.¹⁸ However, the cavalry continued to use sabers and lances in combination with firearms up to the first part of the twentieth century.¹⁹

In 1346, a "hand-gonne" was used at the Battle of Crecy to simply frighten some crossbow-men.²⁰ Four hundred and sixty years later, in the Napoleonic era, a well-trained infantryman could load and fire a one-ounce lead ball, two times a minute and hit a target one-hundred feet long and six feet tall at one-hundred yards half the time.²¹ Also, the infantry shoulder-fired weapon was much reduced in size and weight, making it easier to carry and therefore as mobile as the man himself.

The first illustration of any cannon in use in Western Europe is from 1327 and shows a bottle shaped "fiery weapon" firing a giant metal arrow at a castle gate. For the next century, cannons were considered no more than an adjunct to the traditional *trebuchets* and other siege engines. The cannon started to come into its own as a siege weapon in the 1450s, but due to its massive size their use was limited to campaigns where they could be transported by water, or when the armies only moved at the very slow pace set by having to cart the huge guns over land.²²

This kind of war in slow motion changed suddenly in 1494 when Charles VIII of France crashed over the Alps with a siege

train of some forty brass guns, all wheeled and all firing iron shot.²³ These guns were both more mobile and more powerful than anything yet seen. Contemporaries recognized this as a revolutionary change. Before 1494, “the capture of a castle took up almost a whole campaign . . . and wars lasted a very long time . . . the French came upon all this like a tempest which turns everything upside down . . . Wars became sudden and violent . . . cities were reduced . . . in a matter of days and hours rather than months.”²⁴ Charles had also brought thirty brass field guns, which were mobile enough to keep up with the infantry. But the cannons still had a very slow rate of fire and were not very effective in open field battles.²⁵ Yet less than twenty years later, field artillery was a key element in the French victory at the Battle of Ravenna.²⁶

The next two major steps in the development of field artillery took place in Northern Europe in the seventeenth century with Maurice of Nassau standardizing the Dutch artillery to four different calibers, thereby simplifying logistics for the guns. Meanwhile, Maurice’s primary opponent, the Spanish, had some fifty kinds of guns with more than twenty different calibers. The Swedish king, Gustavus Adolphus, took Maurice’s reforms and advanced them by having very light guns cast and also by using interchangeable parts. His guns also achieved significant tactical mobility and a rapid firing rate. Lastly, Gustavus organized his guns into permanent batteries, with a fixed organization and chain-of-command.²⁷

In the mid and late 1700s the French artilleryman, Lieutenant General Jean-Baptiste Vaquette de Gribeauval, developed and imposed a new artillery system on the French army. Appointed Inspector of Artillery in 1776, Gribeauval also developed a new aiming sight, a more mobile gun carriage and larger ammunition caissons. By enforcing higher manufacturing standards and finer bore tolerances, the weight of the guns was reduced and smaller powder

charges could be used to achieve the same results. By the time young Napoleon Bonaparte was commissioned a Second Lieutenant in the *Artillerie Régiment de la Fère*, the standard French four-pounder weighed a mere six-hundred pounds and could be moved by a team of three horses and serviced by a crew of eight men. These guns moved almost as fast as marching infantry and could hit targets up to a thousand meters away.²⁸

Napoleon said after the 1809 Battle of Loebau: “It is with artillery that one makes war.”²⁹ The “Little Corporal” was an artilleryman *par-excellence* and even as Emperor, he would sometimes help site guns before a battle.³⁰ But he also believed in supporting the infantry, admitting that infantry should be supported “with good batteries.”³¹

Napoleon, in a number of ways, capped the Military Revolution in the area of gunpowder weapons. First, he believed that fire, not shock, decided battles, and he acted on that belief.³² In what became known as “the system of the Year XIII”, he ordered at least two six-pounder guns for each infantry regiment, replacing the lighter four-pounder guns. He reorganized the rest of the guns -- usually the heavier twelve-pounders and howitzers-- into divisions, corps or army artillery reserve formations. The army-level artillery was usually under his personal control. He also attempted to have five guns per one thousand infantrymen, but the best he managed was in 1813 at the Battle of Leipzig with three guns per thousand men.³³

Next, Napoleon replaced the civilian contracted drivers for the artillery with soldiers and also insisted that the caissons of ammunition travel with the guns.³⁴ The Emperor could never have enough guns and ammunition. He insisted that the basic load of ammunition be doubled for all his guns.³⁵ Napoleon made the French artillery the best in the world.³⁶ He also created a system of artillery organization and deployment that endured until the large-scale devel-

opment of rapid-firing rifled artillery and indirect fire methods in the early twentieth century.³⁷

“Super-Forts”

The other side of the gunpowder “arms race” was the development of massive fortifications to resist the new and awesomely destructive gunpowder weapons. In the Middle Ages, the lord in his castle or the burghers in their walled city were very nearly invulnerable. Sieges would drag on for months, if not years. The advent of cannon spelled the end of these curtain wall defenses. During the 1494 French invasion of Italy, the walls of the Neapolitan fortress of Monte San Giovanni were breached in a mere eight hours. This fortress had previously withstood a siege of seven years.³⁸ Machiavelli put it this way: “. . . for the impetus of the artillery is such that a wall has not yet been found which is so strong that in a few days it will be battered down.”³⁹

Machiavelli was right for the old styled, tall curtain walls, but was wrong for the new styled forts already being built even as he wrote. The new super fortresses, called *trace italienne* forts, had low and massive angled walls to avoid and deflect cannon balls. They were supplied with heavy artillery of their own and had ditches and flanking positions to prevent direct infantry assaults. In less than one hundred years these defenses had returned warfare to a series of sieges.⁴⁰

Without a doubt, the master of these new forts was Sébastien Le Prestre de Vauban (1633-1707). He was not only a master engineer but also a master besieger. The adage was “a town besieged by Vauban was one taken, while a town defended by him was one saved.”⁴¹ Yet, with the example of formulas of Vauban, still as late as the first decades of the eighteenth century, sieges were the major form of military engagement. The Duke of Marlborough, who campaigned

almost exactly a century before Napoleon, fought only four major open field battles, but conducted thirty sieges in ten years.⁴² These modern forts, where they existed, limited warfare. When battles were fought, the beaten army could quickly retreat behind the next set of forts where the winning force could not reach.⁴³ Even after Napoleon, modern forts were still a problem for many military commanders, with Clausewitz offering advice on how these defenses could be overcome.⁴⁴

Napoleon tried to cut the Gordian knot of defeating these super-forts in a number of ways. First, using a new and excellent road system, he would merely bypass them, like he did in 1797 in Italy.⁴⁵ By a series of rapid marches on the right bank of the River Po, Napoleon's army turned the Austrians out of a series of forts, especially the powerful position at Pavia.⁴⁶ Or by using the massive and very fast armies he had available, he would cut off the fort with one part of his force while maintaining the strategic offensive with another part, as he did at Ulm.⁴⁷ However, when Napoleon could not use either of these methods he fell back on straight forward frontal assaults as he did against "the Great Redoubt" at the 1812 Battle of Borodino and it cost his army dearly.⁴⁸ In short, the *trace italienne* style of super-fort, (indeed any massive, fixed and well-defended fortification) still posed a serious problem for Napoleon when he was on the offensive. Further, he developed and used methods that were only partly successful in thwarting these fixed fortifications.

Strategy, Operations and Tactics

From the time that gunpowder weapons came to the fore, generals and strategists struggled to find effective ways to employ them, particularly on the offense. From the start of the Military Revolution gunpowder weapons favored the defense. Given the slow firing rates of gunpowder weapons, the infantry would dig in, the artillery

would build field fortifications, and the army on the offense would be forced into frontal assaults which generally failed. Therefore, generals on the move would attempt a strategic offense with a tactical defense, or use ambushes to prevent the opposing army from digging in. For example, at Pavia the two sides dug in for three weeks before the Spanish, with a surprise night march, turned the French flank. Or the Battle of Battle of Saint-Quentin when the Spanish ambushed and defeated a French force.⁴⁹

During the seventeenth century the firing rate for all gunpowder weapons increased. They also became lighter and more maneuverable. Soldiers now formed up in lines rather than blocks; allowing more fire power to be deployed to the front and lessening the effect of incoming firing as well.⁵⁰ Advancing volley fire was developed as a tactic.⁵¹ Also, “horse, foote and artillerie” started to work closely together in combined arms tactical operations.⁵²

After the Wars of Religion (circa 1524 to 1648), Europe drifted into the time of so-called Cabinet Wars: wars fought by small, professional, highly trained militaries with large mercenary elements for limited objectives. While married to maneuver rather than battle to decide the issue, the armies were still slow moving and tied to supply depots. Civilians were generally left alone and the continued existence of the belligerent nations was not at stake.⁵³

The French Revolution ended the era of these slow moving, gentlemanly contests. Threatened from every side and with the Royal Army a hollow force, the revolutionary leadership, in the person of Lazare Carnot, declared the *levee en masse* and created a nation-at-arms. Unfortunately, it was a largely untrained, if enthusiastic, army at first. Therefore new tactics had to be developed to utilize this large force to its best advantage. The long thin line was replaced by the column of attack with a swarm of skirmishers in front to help break the enemy’s line. However, the Revolutionary Army had at

best a mixed record with these tactics, losing as many battles as it won.⁵⁴

In the area of strategy and tactics Napoleon was the master. At Saint Helena, he wrote, “My great talent, what characterizes me the most, is that in everything I see clearly.”⁵⁵ What he saw most clearly was that wars should be, as Frederick the Great said: “short and lively . . . a long war depopulates our country and exhausts our resources.”⁵⁶ The Napoleonic strategy for these short and lively wars was designed to accomplish the destruction of his enemies’ will to resist.⁵⁷ There were no “cabinet wars” for the Emperor.

Napoleon’s method to crush his opponent was the destruction of their field forces in one climatic battle.⁵⁸ There were three essential elements of the Emperor’s operational planning, which he used to gain advantage on the battlefield. First was the *la manoeuvre sur les derriere*, or “the move to the rear”; in which one part of the French Army would sweep into the rear of the enemy to cut his lines of communication, while another part attacked and fixed the enemy force in place. Napoleon used this move some thirty times between 1796 and 1815, for example at Ulm in 1805, Wagram in 1809 and Smolensk in 1812. His other favorite was the *strategie de la position centrale*, or “the strategy of the central position”; such as at Lodi where Napoleon would place his army between two enemy forces, then concentrate his strength against a weaker part of the enemy first, then turn and defeat both part in detail.⁵⁹ It was his failure to seize the central position that lead to his defeat at Waterloo.⁶⁰ The Emperor explained: “Generalship consists in, when actually inferior in [total] numbers to the enemy, being superior to him on the battlefield.”⁶¹ The last type of strategic move he used was the *penetration strategique* or “strategic penetration” wherein Napoleon would break the enemy’s defensive cordon at some weak point to push his army into a strategically advantageous position. This last strategy was only

made, though, as a preface to Napoleon transitioning to one of the other two.⁶²

Unlike the previous generation of military leaders, Napoleon saw campaign and battle as a seamless whole designed to reach a favorable politico-military decision.⁶³ He applied the same basic system of maneuver and attack to his strategy and his tactics. First, he was wedded to the offensive – both strategically and tactically. He stated clearly: “Make war offensively, like Alexander, Hannibal, Caesar, Gustavus Adolphus, Turenne, Eugene and Frederick . . . model yourself on them, it is the sole means to become a great captain and fathom the secrets of the art.”⁶⁴ Next, as mentioned above, he was a firm believer in firepower to win battles. Further, Napoleon often said: “It is by turning the enemy, by attacking his flank, that battles are won.”⁶⁵

The ideal Napoleonic battle had a certain rhythm and flow of action: After penetrating deeply into enemy territory and finding the main enemy field force, one of Napoleon’s corps would fix the enemy in place by attacking their front, while another force would be moving to turn the enemy’s flank. At the same time, Napoleon would organize a “grand battery” of artillery to breach the enemy’s battle line. All these moves were made to break the enemy’s “equilibrium.” Then the Emperor would use his reserves, commonly a cavalry force, to effect the final rupture of the line and engage in a pursuit to annihilate the enemy army.⁶⁶

Only Napoleon’s reorganization of the French Army into permanent *Corps d’Armee* made this battle tempo possible. Each *Corps* was essentially a miniature army; each possessed cavalry, artillery and infantry and each was large enough that it could fight independently until another *Corps* could come to its support. Also included in the *Corps* organization was a strong central reserve under Napoleon’s personal command. It was this strong central reserve

that Napoleon used to break the enemy's line and then pursue the defeated army.⁶⁷ In this aspect of the Military Revolution, Napoleon was not a radical innovator but rather applied his genius to the ideals of others, such as those of Frederick the Great and Pierre-Joseph Bourcet, then combined those ideals into a practicable and nearly infallible strategic and tactical system of war.⁶⁸

Vast Armies, Professional Officers, Effective Administration

Over the course of the Military Revolution armies vastly increased in size. From 1500 to 1700 France's army grew from fifty thousand to over three-hundred and ninety thousand. Even a small, and at that time, relatively poor country like England managed a fourfold increase in military numbers.⁶⁹ By the time of Austerlitz, the French Army could deploy over four-hundred and fifty thousand men and by 1812 over seven-hundred and fifty thousand; however, many of those were from allied, or client states, not just France.⁷⁰ Merely supplying, feeding, paying, and organizing these vast numbers required training, professionalism, administration, and bureaucracy.

Napoleon, while a firm believer in training and professionalism (and their handmaiden, meritocracy), was not much of an innovator in these areas. The Emperor benefited from Lazare Carnot's system of promoting for skill and merit. Certainly, Carnot recognized talent when he saw it; after all, he promoted eight of Napoleon's later marshals (Jourdan, Massena, Moncey, Bernadotte, Augereau, Berthier, Brune, and Soult) to general. Napoleon merely continued the meritocratic system of promotions and advancement.⁷¹ He also believed that "drill, instruction, and skill are what make real soldiers."⁷² Napoleon firmly believed that every soldier carried a marshal's baton in his knapsack, but it was up to the soldier to bring it out. Certainly the Napoleonic Army represented a true professional meritocracy.

Regardless of background or upbringing every man could achieve. For example, Napoleon's Marshals came from diverse backgrounds including the peasantry, the middle class (like Napoleon himself) and the old nobility. Further, many of the Marshals were also raised to the new Napoleonic nobility. Two Marshals of the Empire became kings: Jean-Baptiste Bernadotte, became King of Sweden and Joachim-Napoléon Murat was made King of Naples.⁷³ Background did not matter, but ability certainly did.

Napoleon greatly expanded the existing system of both civil and military education. He reorganized the French education system by taking it out of the church's hands and putting it under centralized state control. The Lycees system was very militaristic in its organization, with drums calling the students to class.⁷⁴ The new school system was surprisingly narrow in its curriculum, focusing on Latin and mathematics, leaving out almost all advanced sciences. Those that did study the advanced sciences, such as physics or chemistry, were destined for the advanced military academy *De École Spéciale Militaire de Saint-Cyr* or "The Special Military School of Saint-Cyr" created by Napoleon in 1802. It was generally assumed that those students that studied math would enter the army directly. He also "militarized" the *Ecole Polytechnique*, or "The Polytechnic School," turning it into a school for artillery officers and military engineers. The Lycees system was designed, at least in part, to provide an educated military and bureaucratic cadre for the Napoleonic war machine. This link between the Lycees and the military was best demonstrated in 1812 when the War Ministry simply requested and received the finest mathematics students and sent them straight from school to the battlefield.⁷⁵

Napoleon's motto may have been "a career open to talent, without distinction of birth,"⁷⁶ but ultimately that meant just military talent. For example, the famed Legion of Honor in August 1804

was 99.5 percent military; that is to say, only ten charter members out of the original two thousand were civilians. Even by 1814, of the Legion's thirty-eight thousand members fewer than four percent were civilians.⁷⁷

Napoleon rationalized, centralized and secularized France, all to feed a vast military machine. To pay for his military, Napoleon created *De Banque de France* "The Bank of France." Further, he eliminated internal tariffs and imposed a central auditing system.⁷⁸ His tax collection apparatus was so efficient that, even while supporting a four-hundred thousand man army as well as a large navy, he managed to balance the budget.⁷⁹ Napoleon claimed his financial system was the envy of all other nations.⁸⁰

Conscription, the tool that allowed Napoleon to build his vast armies, was under the control of the Ministry of the Interior: "the only ministry that counted."⁸¹ The Emperor believed in conscription as a way to not only raise a large number of troops but also to impose strong social discipline on the French and to equalize society.⁸² He allowed almost no exemptions to the draft.⁸³ The Emperor paid close attention to conscription rates.⁸⁴ He often put a great deal of political pressure on officials that failed to produce.⁸⁵ From 1800 to 1815 the French state drafted more than two million men and imposed the draft on its allied and client nation-states as well.⁸⁶

However, Napoleon, despite his genius in other areas, was never able to solve the problem of logistics for his armies. The Napoleonic supply system has been described as "ramshackle" at best.⁸⁷ By freeing his army from long, slow moving supply trains and fixed supply depots, he made it fast and deadly, but living off the land had its limits. In poor areas, regions with bad weather, or regions with limited chances to forage, French armies could and did suffer from serious food shortages such as at Ulm and in Poland and Russia. Efforts to improve the supply and transportation systems by creat-

ing specialized supply battalions equipped with wagons and by establishing some limited supply depots generally fell short.⁸⁸ Napoleon, as one writer observed: “failed the logistics test.”⁸⁹

Conclusion

John of Salisbury once remarked about what his old teacher and mentor, Bernard of Chartres, used to tell his students: "(He) used to compare us to dwarfs perched on the shoulders of giants. He pointed out that we see more and further than our predecessors, not because we have keener vision or greater height, but because we are lifted up and borne aloft on their gigantic stature."⁹⁰ The same may be said for Napoleon. From within the epoch of the Military Revolution, Napoleon stood on the shoulders of giants such as King Charles VIII of France, Maurice of Nassau, Gustavus Adolphus, Frederick the Great, Gribenauval, and Carnot -- to name just a few. This does not diminish him or his accomplishments. Napoleon stood at the top of the three-hundred-year edifice of military innovation and development. In many ways, he represented the apex or apotheosis of the Military Revolution and set his seal on many aspects of war and the military – and continued to hold influence for the two centuries that have elapsed since his death.

Notes

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