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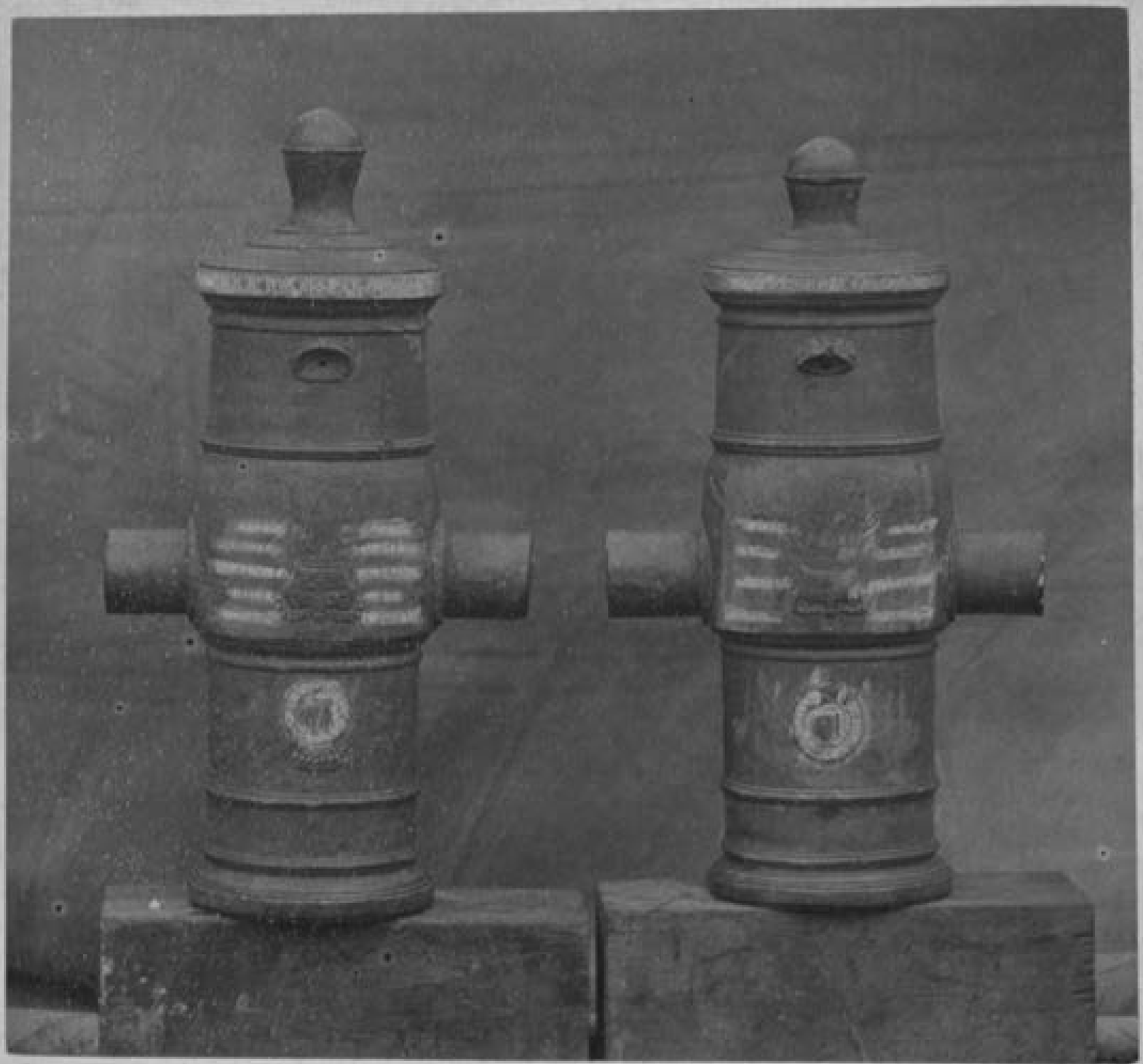

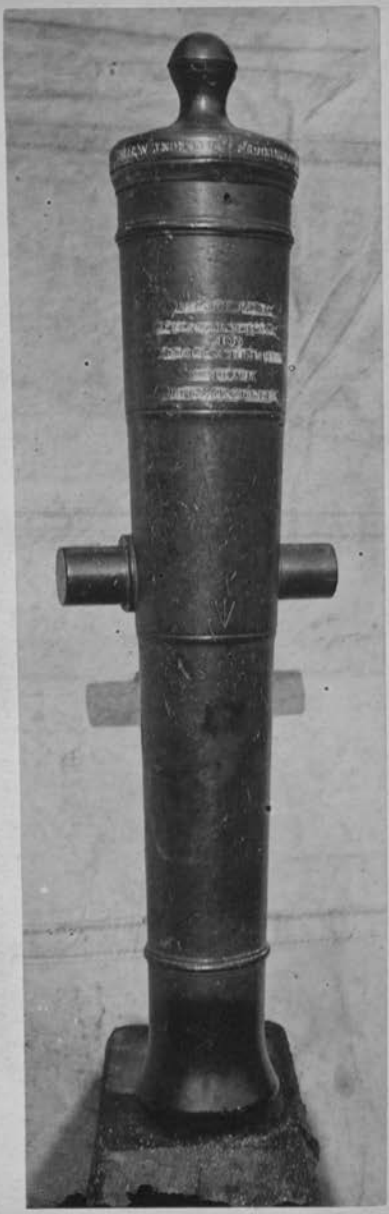

The Boston Type Foundry, Established in 1817

SPECIMENS

OF

ROMAN FACES

FOR NEWSPAPER AND BOOK WORK

CAST AT THE

BOSTON TYPE FOUNDRY

PRINTED AT THE BOSTON TYPE FOUNDRY
NO. 104 MILK STREET
1890

THE BOST

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FOR

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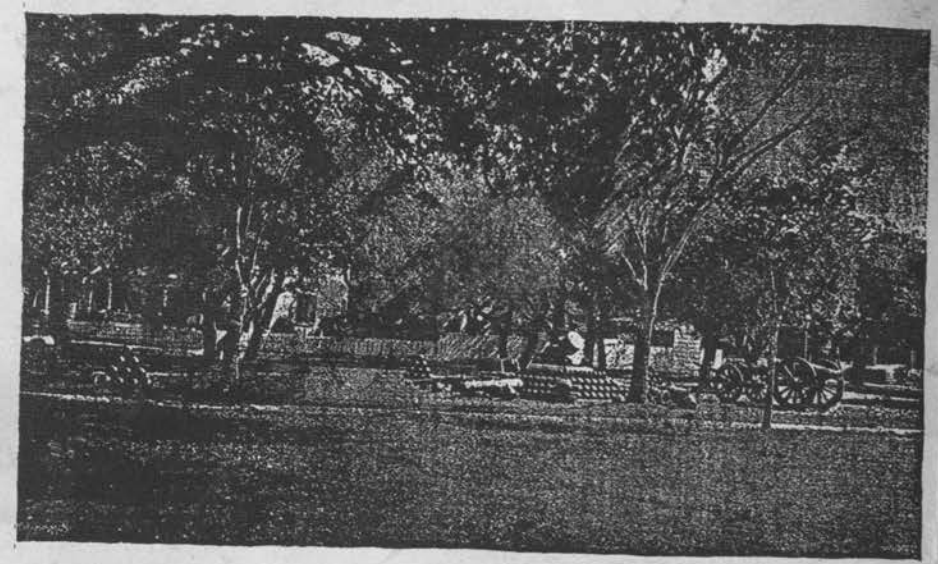
PRINT

THE TROPHY PARK AT FORT MONROE.



TROPHY PARK AND ANCIENT MOUNTED GUN.
(Photograph by Col. Pennington. Photocaustic by Heliotype Company.)

THE ORIGIN OF THE WORK.

In the spring of 1886 an impatient invalid, suffering partly from the shock of a railway collision, and partly from that tiresome idleness called "absolute rest," was aimlessly lounging over the parade ground at Fort Monroe. A little girl, his companion, was attracted by the star-formed Trophy Park on the grass, near the Adjutant's quarters, and began to examine it.

The care of the chief of the school, Gen. John C. Tidball, has rescued from the seclusion of ordnance yards and the obscurity of gun-houses, where they served no useful purpose, these guns, and brought them together to teach their object lesson to the thousands of leisurely Americans who yearly visit the fort, as well as to the young artillery officers under post-graduate instruction.

The child, after a short examination, aroused the convalescent's attention by the natural inquiry, "Papa, what do all these queer crowns and shields and figures mean?" An attempt at prompt answer resulted in imparting little information. The Royal Arms and ciphers were readily recognized, as well as the Arms of Argyle and the cipher of Ligonier. But the Montagu arms might have belonged to Montagu or Manchester, and the Montagu cipher to Marlborough. The Sackville inscription helped the explanation, still leaving the answer very incomplete.

Some slight remembrance of antiquarian study in college had served to start the explanation, and the imperfect heraldic decipherment gave new information to some bystanders, who opened conversation. An officer then present, asked that what was said might be written out, for notes to the post catalogue of guns, and this work was then undertaken.

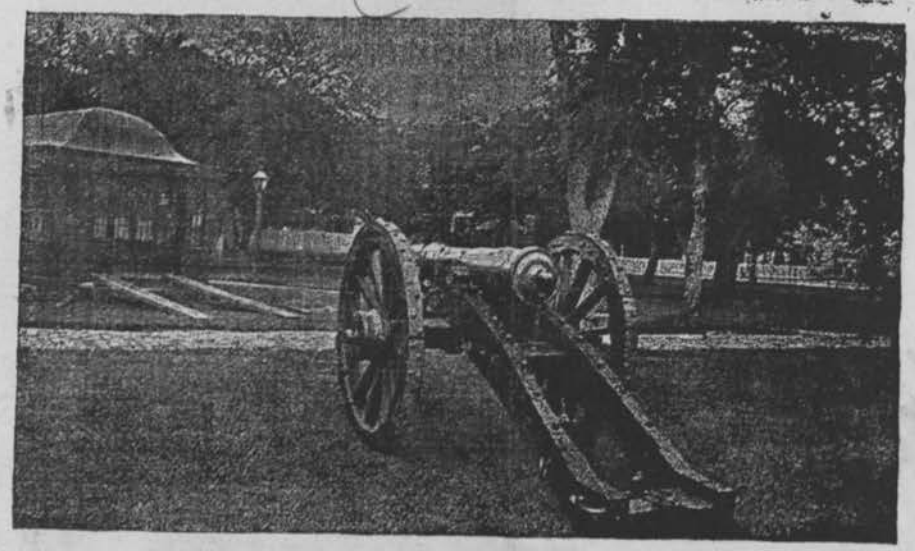
The task was far from simple. An extensive correspondence has been necessary to collect the materials for illustration, and to find that much of the desired material could not be obtained, and has caused great delay.

It was hoped to give some account of the persons connected with the guns as manufacturers and modellers, as capturing and surrendering commanders, and to give the spectator some idea of the appearance of these guns when they were weapons, and recall how this Trophy Park illustrates the history of artillery.

GENERAL CHARACTERISTICS.

All of the guns on the grass, save one, the smallest and oldest, bear the inscription, "Surrendered by the capitulation of Yorktown, October 19, 1781."

Close by the Trophy Park, in a glass pavilion, is a short, old, bronze 24-pounder on an old-fashioned carriage, the hind wheels of which have sectional tires, and the fore wheels of which are much smaller than the hind wheels This gun formerly stood close to the Park, as seen in the first illustration.



GUN SURRENDERED AT SARATOGA, SHOWING ANCIENT FORM OF CARRIAGE AND SECTIONAL TIRES.
(Artillery School photograph. Heliotype Company photocaustic.)

This gun has chased upon it in front of its trunnions the inscription, "Surrendered by the Convention at Saratoga, October 17, 1777."

THE first thought of a Yankee farmer, on coming to the years of manhood, is to settle himself in the world, which means nothing more than to begin his rambles. To this end he takes to himself for a wife some buxom rustic heiress, passing rich in

wilderness, large enough for a parish church, and furnished with windows of all dimensions; but so rickety and flimsey withal, that every blast gives it a fit of the ague. By the time the outside of this

THE EVENTS.

These two October days are proud anniversaries in the history of the Republic.

Saratoga has been classed with Marathon and Waterloo among the fifteen decisive battles of the world. Yorktown is yet a prouder name than Saratoga, because at Yorktown a judicious plan, skilful combinations, and vigorous action led to comprehensive results, and demonstrated to the English king and ministry that independence was inevitable. It sanctioned to military critics later, the eulogium of Frederic of Prussia on Washington, in the presentation copy of his memoirs, "The oldest general in the world to the greatest general in the world."

Washington had no competitor in the generalship of that campaign. An American leader led to victory American and French troops. He had cordial co-operation from all his own command, and his success was insured by personal sacrifices on the part of Rochambeau, de Grasse, de Barras, and Saint Simon; by unsurpassed valor on the part of the French and American troops, and by a military skill in division, brigade, and battalion commanders almost absolutely faultless, and which indicated, among the French, the high command which many of them afterwards held abroad.

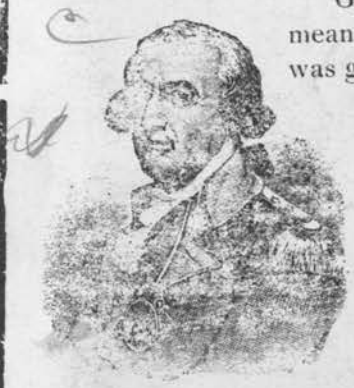
At Saratoga we look in vain for a glory centralized on the commanding general. Schuyler's anxious forethought, Washington's courage and sacrifices, Arnold's heroism and conduct, Lincoln's energetic assemblage and march of reinforcements, the prompt and vigorous action of the Eastern governors, the courage, devotion, and skill of Stark and Herkimer, of Poor, Ganzevoort, Learned, Morgan, Parsons, Dearborn, Cilley, and other brigade and battalion commanders, the desperate valor of company officers and enlisted men, stayed the current of invasion, returned it towards its source, and earned the defeat of the expedition from Canada, and the gratitude of a rising nation.

But of Gates, we know only his intrigues, his demands for help, his posturing as a magnanimous conquerer, his failure to comprehend the scope and consequences of a great negotiation.

THE VICTORIOUS GENERALS.

The contrast between the American commanders was great. WASHINGTON was cold, proud, self-contained, thrifty, and generous. He loved authority

and power, that he might benefit others by its exercise. He was never elated by success, never overwhelmed by failure. His courage was conspicuous, his conduct in victory or defeat judicious and vigorous. In his culminating triumph at Yorktown he thought to compensate Lincoln for the mortification of the surrender of Charleston, by deputing him to receive the sword of a greater British general than Sir Henry Clinton, to whom Lincoln had lost his own. In his darkest hour at Valley Forge, surrounded by ragged, barefooted, famished troops, with an imbecile commissariat, a quartermaster's department inefficient in officers, and absolutely null in resources, upbraided for lack of energy, — the Conway cabal blossoming in Congress, in the board of war, and among his division generals, — no peevish or selfish word escapes him. He urges his soldiers' claims. He points out the needs of the army. He seeks justice for his generals, his officers, his men. But confidently and without personal argument he leaves his own justification to posterity.

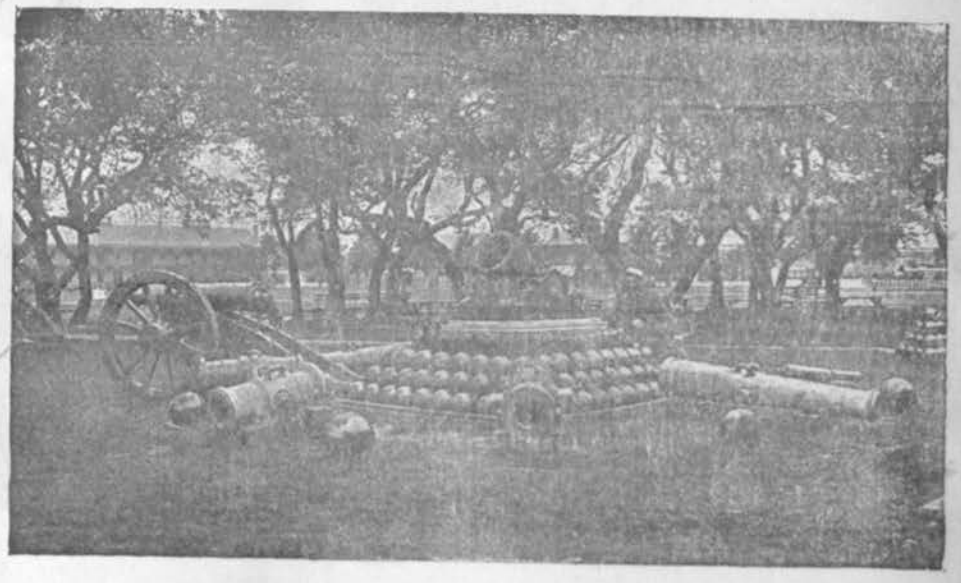


GATES was vain, effusive, self-seeking, lavish, and mean. He coveted power and place as a proof that he was getting on. He was puffed up by success. He was limp under failure. He arrogated to himself all the glory of the strategy, the tactics, and the fighting around Saratoga, but he abandoned Washington at Trenton, and DeKalb at Camden, and held everybody else blameworthy for the disasters in the Carolinas. No competent military critic ever classed him among the captains. His military career contains many cautions to commanders, but no examples.

THE GENERALS WHO SURRENDERED.

SIR JOHN BURGOYNE was 54 years old at the time of his surrender. His attractive manners won him in early life the hand, in a runaway marriage, of a daughter of the Stanleys. His fine address reconciled his father-in-law, the Earl of Derby. His personal merit conciliated friendship and esteem, and justified the active influence of that great noble for his advancement. He served in the infantry, the dragoons, the Coldstreams, and in 1759 was allowed to raise a regiment of horse. His military service in Portugal indicated considerable fitness for command. At Bunker Hill he was in charge of the artillery on Copp's Hill, and used it in aid of Howe's assault with satisfactory skill and vigor. His description of the battle demonstrated

that he had the eye of a trained observer and the brain of a competent military critic. His observations in Canada in 1776 were creditable and soldierly. In his parliamentary career he proved himself so close, accurate, and captivating a debater, that he was chosen, late in life, one of the managers of the Hastings impeachment. As a dramatist he showed such knowledge of human nature and such constructive art that his dramas held the stage till quite recently, and are still considered acting plays. In the use of terse, vigorous, idiomatic English, he was unsurpassed by his contemporaries. At the time of his surrender he obtained terms from Gates which embarrassed him and the American Congress for years.



TROPHY PARK, SHOWING THE SARATOGA GUN UNLIMBERED.
(From an Artillery School photograph.)

His plan was judicious. Heavy reinforcements were to be sent to Canada and to New York. Adequate supplies and means of transportation were to be accumulated. A movable column of about 10,000 effective troops, with from 1000 to 2000 camp-followers and auxiliaries, was to set out about the first of June and force the passage of Lake Champlain to the head-waters of the Hudson, and then, crossing the river, move down the west bank to the mouth of the Mohawk. A flanking column about 2000 strong was to start from Oswego after Burgoyne had forced the lakes, cross the Ontario foothills, and move by the left bank of the Mohawk to meet Burgoyne opposite Troy. It was intended to bridge the Hudson in August or September, and at this juncture an adequate force from New York was to advance up the river, capture the forts on the banks, and establish itself at Albany across the communications of the American army deployed to resist the descent. Aid

from New York in August or September was as much a part of the plan as provisions for the troops. It was promised; orders for it were prepared in England; but a dinner engagement of the English Minister delayed their signature, and they were never sent.

The objective point was well selected. The junction of the Mohawk and Hudson was, before the days of railroads, the key of the Northeast. Burgoyne's estimate of the force required was adequate. He was scrimped in the number and in the quality of his troops. His British grenadiers, light infantry, artillery, and battalions of the line, about 3500 muskets, were as good as might be, but were hardly a third of the force he had estimated to be adequate. He had in his German infantry about 2600 muskets. A third of these were old soldiers and two thirds reluctant forced-levies. All had, however, been assiduously and judiciously drilled for their work by Reidesel. He had 500 excellent artillerists, English and German, a few hundred Indians, a small command of Canadian volunteers, and Baum's Brunswick dragoons dismounted. The military part of the expedition was about 8000, including officers; the batmen, teamsters, laborers, and other camp-followers not enlisted, and the Indians, made the whole number of his column about 10,000 officers and men. The flanking column entrusted to St. Leger was composed of 750 troops and about 1000 Indians, and rendered no service. Considering both numbers and quality, Burgoyne's outfit had more than half, but not quite two thirds, the offensive power he desired. The English part of the artillery train was almost a duplicate of that provided for Frederic the Great's invasion of Silesia in 1741. Forty-two pieces were surrendered, eight were captured on the 7th of October, and four more at Bennington. Some of the guns were attached to the German regiments. From the artillery order-book, there appear to have been of English guns, eight three-pounders, sixteen six-pounders, four twelve-pounders, two twenty-four-pounders, four five-inch howitzers, or Royals, and four eight-inch howitzers. About thirty tons of cannon ammunition was taken along. The train included five hundred wagons and fifteen hundred horses. Many of the carriages, when loaded, weighed over a ton. The supplies for the army were to be drawn from a distant base or from a sparsely populated

REIDESEL.

country. Much of the route lay over forest paths, which were converted into roads, and through swamps, where the engineers diversified their labors of making corduroy roads only by their work in making corduroy bridges.

A wide and deep river lay near the end of the route, as difficult to bridge with improvised material as any theretofore encountered in European warfare. By the first of August he had reached the Hudson, and needed only provisions, and a bridge to cross it.

The American army was only 9000 strong, and was at the very mouth of the Mohawk, less than ten miles above Albany. By the middle of August Burgoyne's attempt to mount his cavalry, to horse his wagons, and to gather supplies from the country, had failed at Bennington, and with his worn-out teams and wearied men he set himself the task of bringing up nearly two hundred thousand rations and a supply fleet of boats to accompany his army down the Hudson. By the thir-

7.11/5/88

teenth of September the bridge was built, a hundred and eighty boats were brought over difficult portages and launched on the Hudson, the thirty days' supplies were loaded, and the army was ready to advance. He was obliged to reduce his artillery train by putting half his ammunition on boats, and his teams were so worn out and his artillerists so depleted that more than five hundred infantry were detailed as guns' crews for the cannon.

Dismounted Dragoon, after Darnocel

Sir William Howe had set out for the Chesapeake with 18,000 men without hearing from Burgoyne, and was tossing on the Atlantic ocean at this critical last half of August. No force was left at New York adequate to alarm the northern army about their communications, and the nine thousand men collected opposite Troy in early August had been allowed to gather reinforcements and take position unmolested, till, at the vital moment, a fortified camp of 20,000 men barred the advance at Bemis' Heights.

Against this force, Burgoyne led an aggregate in officers and men of about six thousand, and could probably put in line of battle not over four thousand muskets, and had perhaps twenty field guns available in an advance movement. He had shot his bolt. His force, originally about two thirds as powerful as desired, had been depleted by its unexpected work. His land transportation had been annihilated. He had stuck to his objective, and wisely modified his details of operation, and stood facing his enemy at the point where he contracted for co-operation, and at the time when he had arranged to expect it. He had kept his cheerfulness through all, and his men were in good spirits. He fought his two battles in September and October with spirit and skill. He met his reverse with dignity. He told of it with becoming modesty, without querulousness and with no evasion of responsibility. In order to sneer at him, the greatest of English soldiers was slandered. "It would have been better to have beaten the enemy and have misspelt every word of the despatch, for so probably the great Duke of Marlborough would

FROM THE SURRENDERED GUN.

have done by the one and by the other." After Burgoyne's return to England he was a conspicuous figure in history for fourteen years.

When it is necessary to slander Marlborough in order to blame Burgoyne, the criticism answers itself.

CORNWALLIS.
(From the Guildhall portrait by Copley.)

In the perspective of history Burgoyne will have the position of a competent commander who did great things with small means, and whose failure was attributable to the absence of Sir William Howe from New York, to the lack of initiative and inadequate force of Clinton, to the unenterprising character of Clinton's lieutenant, Vaughn, and, above all, that the movement on Albany was not positively ordered from England, but was left discretionary with Sir William Howe, whose force for this as well as other operations was left inadequate.

No Englishman of the last century was more carefully trained for the duties of high position than Charles, Earl of Cornwallis. None held more conspicuous positions, or with better results to the British Empire. After graduating at Westminster School and at an Italian military college, he was appointed a captain on the staff of the Marquis of Granby in 1759. He won golden opinions as an aide-de-camp, and on promotion to field officer's rank, proved himself a skilful tactician and an admirable disciplinarian, sympathetic and just to his men, exact, rigid, and unflinching in his duty to his commander and to his command. His regiment soon became, and continued to be, a model. He was an extreme liberal in politics, and opposed in Parliament the fatal course of the ministry towards

YORKTOWN INSCRIPTION.

America. Promoted to Major General, he came here in 1776, and was the right hand of Sir William Howe in the field.

When Sir Henry Clinton took general control, Cornwallis commanded the field army of the South, and was successful over Gates and Greene in battle, but was baffled by the latter's strategy, and was out-manœuvred by Lafayette.

The campaigns of 1780 and 1781 are almost the only break in Cornwallis' career of deserved and earned prosperity. He pacified Ireland in a vice-royalty which is to this day a traditional golden age. As Governor General of Bengal, he crushed and broke the power of Mysore. He was a negotiator of the peace of Amiens. He was rewarded by the post of Master of Ordnance and by a promotion in the peerage. Under his command, Lord Rawdon, afterwards so famous as Earl of Moira and Marquis of Hastings, was trained. Wellington's first service as a field officer was in his regiment.

In the very last year of his life he was again sent to India as Governor General of the whole country, and died at his post of duty.

Unquestionably, no British generals who served against the Colonies equalled in abilities, either as statesmen or soldiers, these two who were the most unfortunate. None subsequently held so large a place in the eye of the world. None deserved better of their country or of humanity than they.

In these two episodes of theirs they failed, largely because success depended on the difficult military art of devising and executing converging movements of concentration and of securing the co-operation of independent and distant commanders at critical moments, — an art which has been possessed in its perfection only by Hannibal, Cæsar, Marlborough, Napoleon, and Moltke, and in a lesser degree by some of our own and the Confederate generals of the civil war, and which is so difficult as to seem almost impossible, unaided by telegraph, railroad, and steamboat.

NOTE. In the original copperplate, of which the opposite cut is a reproduction, is a legend in two columns, of which the following is a translation: —

"8000 English soldiers and sailors beleaguered at York in Virginia by the combined army of the United States of America and of France, laid down their arms and surrendered as prisoners of war the 19th October, 1781, abandoning to the victors 22 flags, 170 cannon, and 8 mortars. The Charon, a ship of 50 guns, a frigate, 2 corvettes, and 60 transports were taken or destroyed. The victorious army, under the orders of Gen. Washington and M. de Rochambeau, had for general officers Messieurs de la Fayette, Lincoln, Steuben, de Veiden, Messieurs de Viomesuil, des Chatelux, de S. Simon, de Choisy, de Custine, and de Lauzun. Among the distinguished officers we note Messieurs Robert Dillon, Scheldon, Beffroy, and

It is probable that the trophy inscriptions on the Saratoga and Yorktown captures were chased on them by the artillerists of Stevens' battalion, who were at both places. Stevens enlisted his men in Boston and vicinity, and it is a matter of tradition that many of the silversmiths and coppersmiths who had been trained in the arts of design and of chiselling in the shops of Paul Revere, of Phillipse, of Loring, and of Thomas and Benjamin Clarke, enlisted in Stevens' battalion which was raised for the Northern army in 1777, and the artificer company of which was attached to the general park before the Yorktown campaign.

JOURDAN.
(After Chardon.)

As these journeymen took up anew the hammer and chasing chisel, and designed, traced, and incised this record of Peace and Freedom won by the sword, how they illustrated the motto of their own State, "*Ense petit placidam sub Libertate quietem*." As they glanced around them at the generous allies of America, they could not fail to wonder what fate Fortune reserved for

ROCHAMBEAU.
(After Trumbull.)

THE BYSTANDERS.

Among those thus looking on were four who were to grasp the baton of Marshal of France, — ROCHAMBEAU, commander of the contingent; JOURDAN, general in chief on the Rhine, on the Sambre and Meuse, on the Danube, and in Italy, always trusted by Napoleon with independent command, victor at Fleurus, military mentor of Prince Eugene, conductor of Joseph's Spanish war; BERTHIER, prince of Neuchatel and Wagram, the trusted chief of staff of Napoleon; and BERNADOTTE, prince of Ponte-Corvo, and founder of the present royal family of Sweden.

Others there present were to hold commands equivalent to a marshal's, or to exercise great influence in the making of history, — BEAUHARNAIS, whose widow was an empress, whose chil-

Monthurel. The wounds of Messieurs de S. Simon, de Deux Ponts, de Sirenil, de Lameth, Billi, Dillon, and du Tertre give them a claim to public recognition.

"September 5, Count de Grasse, commanding the French fleet, having under his orders Messieurs de Monteil and de Bougainville, fought Admiral Graves, who came to the rescue of Lord Cornwallis. The 74-gun ship Terrible was burned, the frigates Iris and Richmond taken. We regret Captain de Boades killed. Messieurs d'Orvault, Rhaub, and Villeon were wounded in supporting the honor of the French flag."

REDDITION DE L'ARMEE DU LORD CORNWALLIS.
(Relief plate by Heliotype Co. from the old copperplate print.)

Dessiné par Godfroy de l'Académie Impériale et Royale, &c. *Gravé par le Barbier Peintre du Roy.*

dren were imperial princes, one viceroy of Italy and grand duke, the other queen of Holland, and mother of an emperor; who himself commanded the armies of the Rhine and of the Moselle, and was minister of war; CUSTINE, captor of Mentz and Frankfort; LAUZUN, descended from more than one marshal, known under the Republic as BIRON, who mounted the guillotine with a jest, rather than practise inhumanity in *la Vendée;* LAFAYETTE, patriot, statesman, and general, conspicuous before the world from 1776 to 1834; PICHEGRU, one of Napoleon's tutors, conqueror of Holland, twice general in chief on the Rhine, the European inventor of the Revolutionary tactics, — the column of attack veiled by a cloud of sharpshooting skirmishers and protected and supported by massed artillery, the tactics of Jena, Wagram, and Friedland, — a soldier at least as good as Moreau, whose huzzars captured fleets in 1795; a contemptible politician, a conspirator, a traitor, and a suicide.

DE GRASSE.

Of naval officers, there were DE GRASSE, the best French admiral of his day; MORTEMART, victor in the action off Martinique; BOUGAINVILLE, geographer, explorer, and statesman; and LATOUCHE-TREVILLE, conspicuous among the admirals of the Empire for his great good fortune.

BERTHIER.
(After Tardiou.)

Of less note were D'ABOVILLE, colonel of artillery at Yorktown, who was a general of division in the early Revolution and under the Empire, and peer of France at the Restoration; DESANDROUINS, an engineer, member of the National Assembly; MONTESQUIOU, a constituent and a general in chief; MATHIEU DUMAS, publicist as well as soldier, general of division, and aide to Napoleon at Waterloo; DILLON, who gave to Marshal Macdonald his early military training, who was the main support of Dumoriez in the manœvres which preceded Valmy; and ISIDORE LYNCH, Irish by race, English by birth, French by adoption, a cadet in Asia, an aide-de-camp of exceptional coolness, courage, and conduct at Savannah, whose career culminated as a division general at Valmy

under Kellerman. On the campaign and field of Valmy on the baptismal day of the French Republic, Dillon and Lynch, who had been colonels in a part of the French army, conspicuous for near a century in the wars of the monarchy, transmitted the traditions of valor, duty, and conduct of the Irish brigade to the Carmagnoles of the new levies.

LAFAYETTE.
(From an etching.)

Here also at Yorktown was young DE BROGLIE, for a time president of the Constituent Assembly. It was hereditary in his family to merit the baton of marshal, and not unusual to obtain it. He also handed down the best traditions of the royal army to the soldiery of the Republic, when, as a brigadier on the Rhine, he took Desaix as his aide-de-camp, and taught him to obey and to command.

Another constituent, GOUVION, was there colonel of engineers, full of probity and honor. His respect for women forbade him to defend with fire and steel the hotel-de-ville against Parisian mœnads. His experience in facing an enemy made him an unfit jailor for royalty plotting to escape. But he foresaw the ruin of France in the invasion of Austria, and the death of society itself in the plans of the Jacobins. He recognized clearly that a transcendent military prestige was the only hope for those who would avert the evil schemes of the pestilent blood-hunting madmen who soon controlled France, and at the first Austrian drum-tap he left his legislative seat for the command of Lafayette's vanguard. In the rainy murk of a June night, in a trivial skirmish at the front of the camp of Maubeuge, his sorrows ended in a soldier's death, and France placed his bust in her Pantheon.

BEAUHARNAIS.
(After Bonneville.)

Here, too, were Duke MATHIEU DE LAVAL MONTMORENCY, minister of foreign affairs under Louis XVIII., a subordinate in the regiment of his father, Marquis and Colonel, CHASTELLUX, general of the monarchy, and PHILIPPE DE SEGUR, senator, diplomatist, arbiter of court etiquette, general of the Empire, both distinguished in letters as in arms, both members of the Academy; VIOMESNIL, who fell in the defence of the Tuileries; DE LA ROUARIE, who

organized the Breton insurrection, and furnished some traits for Victor Hugo's grand picture of the Marquis of Lantenac; D'AUTICHAMPS, another of the Vendome chiefs; the three LAMETHS, statesmen of the Revolution, generals of the Empire and the Restoration, THEODORE, CHARLES, and ALEXANDER; and the younger ROCHAMBEAU, a general of division, who commanded with credit in Santo Domingo, and fell at the head of his division at Leipsig.

D'AUTICHAMPS.
(After Lionard.)

In the early days of the French Revolution there is no figure so notable as that of him who proposed that the members of the Assembly should be inviolable,—the matchless orator, the patrician tribune, MIRABEAU.

To reconcile the Revolution with France, and France with Europe, to retain for his country the benefits of the Revolution, and to preserve to it the possibility of future greatness when it was prostrate at the feet of angry emperors and kings, the brain most fertile of expedients, the most persuasive speech, the most winning influence, belonged to Prince TALLEYRAND.

In the picturesque spectacle of the Directory, the foreground always presents one personality, smart in embroidered clothes of sightly cut, with lace ruffles and frills and a plumed hat, striking attitudes amid an environment of fine draperies and glittering furniture, transacting public business to the music of a brass band, and the songs of an operatic chorus in modified ballet dress, a pet of the petticoats, a pinchbeck Louis XV., the Director BARRAS, who gave the command of the army of Italy as a wedding gift to young Bonaparte on his marriage with Madame de Beauharnais.

MIRABEAU.
(After Guesin.)

In the last days of the monarchy there is no more characteristic scene than that in which the royal family escape, one by one, through Gouvion's guards to the *Petit Carrousel*, and all but the queen go promptly to the *Rue de l'Echelle* and enter the public carriage there waiting for them, while Marie Antoinette, who insists on directing the combination, goes wandering through the streets of Paris, and over the river, tapping the wheel of Lafayette's carriage with her *badine*, till at the end of an hour she and her guardsman escort reach the appointed place, — characteristic picture

of the recklessness which could trifle with time at such a crisis, of the stupidity which could omit to provide a suitable guide, or of the foolish conceit which could refuse him! On the arrival of the queen, Count AXEL DE FERSEN, who, under the queen's orders, had been the outside man of the combination, and was acting as coachman, drove rapidly to the north road, shifted his fare to Madame de Korff's new berlin, a clumsy "leather bedroom," with six strong horses, and drove it to its first relay on the road to Flanders, from whence it went lumbering on for twenty-four hours till halted at Varennes, where Louis the Locksmith got his only advantage from the evasion in the best Burgundy he ever tasted.

CUSTINE.
(After Mlle. Baron.)

We might feel that there was an incomplete attendance at Yorktown, were these personalities and this episode unrepresented. But Viscount DE MIRABEAU, nicknamed *Le Tonneau*, brother of the orator, Viscount DE TALLEYRAND, commended as "*Va de bon cœur*," and Admiral DE BARRAS, uncle of the Director, lent the family presence to the occasion, and AXEL DE FERSEN was himself there.

Saint Simon, the great socialist philosopher, was present as a captain of foot; and his cousin, the marquis, whose ancestor had declined the baton, who himself became Captain-General in Spain, as a general. The Marquis of Deux Ponts, a Bavarian general at Hohenlinden, commanded his regiment at the siege, with a brother as lieutenant-colonel.

TALLEYRAND.

Of the officers already named, DE LAUZUN, DE BROGLIE, DE SEGUR, and the LAVAL-MONTMORENCYS, were descended from marshals of France, as also were VAUBAN and young NOAILLES, Lafayette's brother-in-law.

It remained for him to move in the National Assembly the abrogation of the privileges of the nobility and the equality of subjects of France before the law, and then to prove by his personal superiority to circumstances and to men, as a negotiator, a merchant, and a financier, the

inequality of mankind in the state. In the last year of his life, in aid of his former comrade, young Rochambeau, he returned to the profession of arms, and added to his youthful reputation by skilful conduct and brave exploits by land and sea.

LAUZUN.
(After Trumbull.)

There was concentrated in that body of eight thousand Frenchmen some of the noblest and best blood of France, and probably no such number had ever assembled which contained so much eminent ability.

Nor should we here forget, while recording these famous Gallic names, whose wearers went back to Europe to fashion its history, to mention also that brave and competent Teuton who cast his lot definitely with us, — the former aide of Frederic, Baron STEUBEN. To his ready and sure appreciation of the American character, to his deep skill in the science of war, to his prompt adjustment to provincial apprehensions of the elements and details of this science which make up the tactics and discipline of an army, to his transcendent genius for instruction which enabled him to incorporate his teachings as a second nature in the soldier's mind, and this, despite the fact that master and pupil had no common speech, was due, more than to anything else, the feeling of mutual dependence, and confidence in their comrades and themselves, which was shown in the marked tenacity of continental troops after the winter at Valley Forge, and was the source and spring of final success. It was not a favor of Fortune to Steuben, but a recompense, which detailed him, as general of the trenches, to receive the proposal of capitulation, and kept him in command of the front line till the capitulation was signed.

STEUBEN.

We must judge the Americans present, not with the partial judgment of a fellow-citizen, but by the fact that they stood by the side of this array of makers of history, and no one has ever suggested that they were not the equals of their foreign allies and comrades in courage, conduct, intelligence, and intellectual resource. They also were makers of a nation.

What an array of public spirit and practical genius was concerned in

wresting these guns from arbitrary power and consecrating them to Liberty!

BOUGAINVILLE.
(After Bailly.)

THE ARTILLERY TRAIN OF 1781.

We must now try to realize how these guns looked when fitted up for war. Most of us have seen the modern field battery. This serves the same purpose as an equivalent part of the Revolutionary train. It consists of the same sub-combinations; guns, gun-carriages, vehicles of transport and service, ammunition, transport animals, tools, and materials of maintenance and repair, gun-screws and artisans. It differs from the old train in a vast number of details of organization, personnel, equipment, and material.

MONTESQUIOU.
(After Guerin.)

Capt. Hamilton kindly had his battery A, of the 2d Artillery, photographed to show a four-gun battery of manœuvre in usual marching order, from which the accompanying cut has been made.

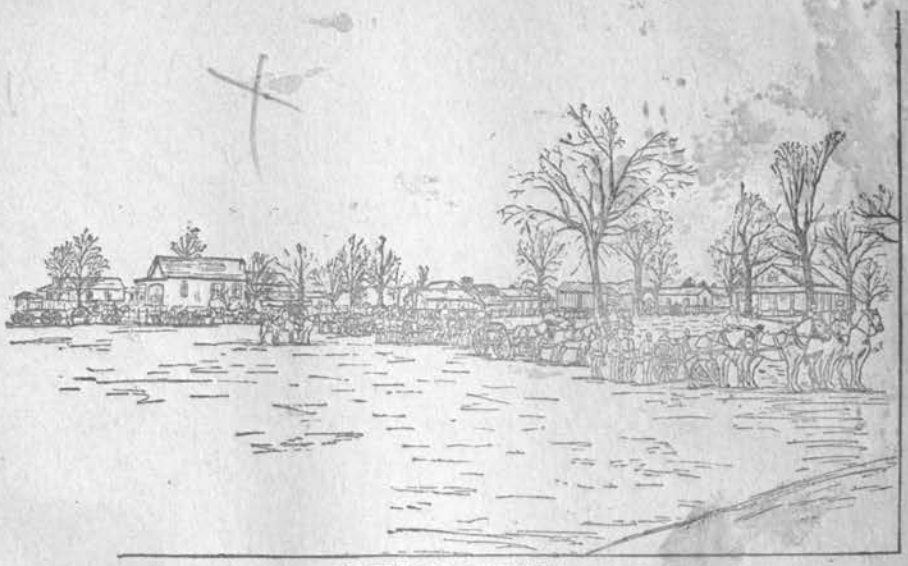
There are in such a battery four sorts of vehicle, — the gun-carriage, the caisson, the forge, and the battery wagon. They have a family resemblance. They employ only one size of wheel, only one size of axle. Each has a fore carriage, called a limber, and a hind carriage. A stout perch, properly framed into the hind axle for the carriage of the load, extends forward from its centre. It is called a trail in the gun-carriage, and a stock in the other vehicles. It terminates at its outer end in a stout iron ring firmly fastened to it, which ring serves to link the perch to a pintle hook, fixed to the fore axle below and behind its centre. Each limber carries a chest; those of the guns and caissons appropriately subdivided for the transport and accessibility of ammunition and implements of combat, those of the forge and battery wagon, of tools and supplies.

C. LAMETH.

The joint between the forge and battery wagon is nearly as flexible as a

ball joint, and thus transmits the draft without cramp, when passing over the roughest of roads, or turning the shortest practical curves.

On each side of the stock or trails, specialized side pieces are framed to



BATTERY A, 2d ARTILLERY.
(From a photograph at Little Rock, Arkansas.)

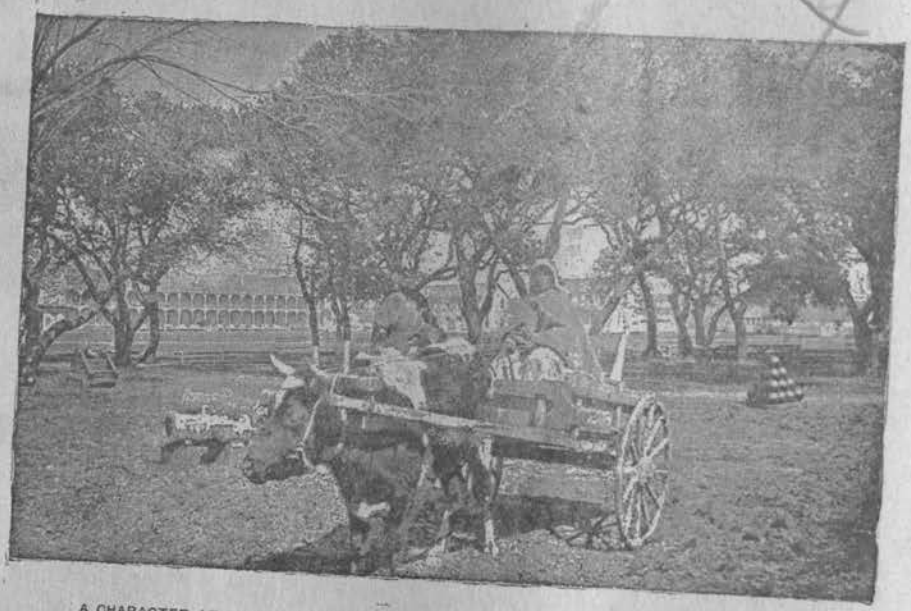
it and to the axle, which furnish trunnion beds for the guns, or make a platform for the boxes or bodies of the other vehicles. Each caisson carries a spare wheel and a spare pole; spare axles and other parts for repair are in the battery wagon. Cannoneers' seats are provided on the chests and on the hind axle of the gun-carriage. The horses are harnessed in pairs and driven

by postilions. There are no whiffletrees or lead bars. Pole chains and a yoke give the wheel horses control of the vehicle, and they are assisted by brakes. In horse batteries some or all of the cannoneers are mounted on horseback.

THE FIRST PREDICTED ECLIPSE.

A battery requires a commander, an officer for every two guns, an officer for the ammunition, two or three administrative sergeants, a sergeant and one or two corporals for every gun, a saddler, one or two wheelwrights, and two or three blacksmiths. One of these must be a competent general workman, one may be only a shoe-fitter, and the third a mere nailer-on. Ten or eleven cannoneers and drivers to a gun is a usual peace establishment, while from twenty to twenty-four are desirable in war. In peace, four horses to each vehicle of combat, with a few more for the officers and sergeants, will answer, while the field battery demands, in war, for all purposes, eight or nine horses to a vehicle, and the horse artillery nearly three times as many.

Except trifling adjustments in battery, and to and from battery, all the work of moving the guns is done by the horses.



A CHARACTER AT FORT MONROE, ILLUSTRATING AN OLD-FASHIONED ARTILLERY TUMBRIL.

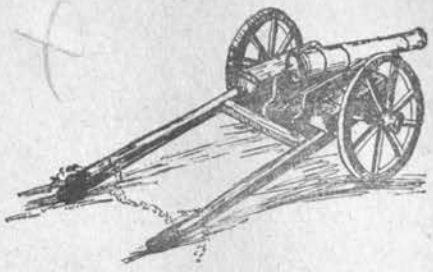
The load which each horse is expected to draw in war is about two thirds his weight. The axles are of iron or steel, and the wheels are boxed with brass or bronze.

There is a rough and efficient simplicity in this organized unit of combat which has caused it to be adopted, with trifling differences of detail, all over the world.

When light machine guns constitute the armament, the organization and outfit are about the same, but the number of guns is increased.

As a systematized and practical unit of organization and combat, the modern field battery is about a quarter of a century younger than the American Revolution.

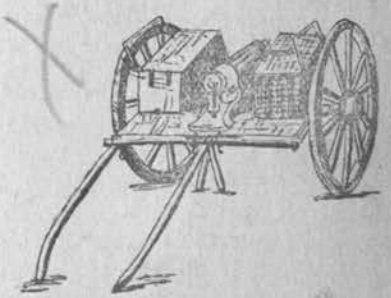
A company of artillery then had but two guns, with as many officers, — at times more officers, — sergeants, musicians, and corporals (gunners and bombardiers) as a modern six-gun battery on a war footing, and it had as many matrosses (artillery privates) as we now have of cannoneers and drivers for two guns.



GALLOPER OF 1777.

The trails of the guns were broad at the outer end, as shown on page 2. They were coupled to the fore carriage on top of the axle by a stiff and deep joint. The tumbrils and powder carts were two-wheel vehicles, like the dump-carts of a city contractor, or the Virginia steer-cart. The supply wagons were long-bodied vehicles with ordinary perches, coupled up without much horizontal or any oscillatory flexibility. The fore and hind wheels of the four-wheeled carriages were not alike, and the wheels of one carriage differed from those of all the others. Spare wheels and other parts could be carried only on the wagons. Some of the wheel tires were sectional and not continuous. The wheels were bushed with thimbles and not boxed. The axles were of wood, with axle skeans. The light guns were on two-wheeled carriages, called "gallopers," from which the horse was unharnessed in action, and the shafts of which served as a trail. This form of carriage has recently been revived and modified for the light Gatling.

No provision was made for carrying the men with the guns, and in action the men dragged the guns round by hand or with rue-raddies. The teams for route were furnished by contract and impressment, and were driven by peasants. The English generals at Fontenoy complained of the embarrassment caused by the contractors and drivers taking away the teams just before the advance of the column of attack. But the runaways were not punished. The heavier guns carried no ammunition on their carriages, and the light ones only a few rounds in inconvenient side boxes which were set on the ground in action. The horses, if more than one was used, were in string teams, and the wheel horse in shafts. Each horse was expected to draw more than his weight. The horses, and at times the limbers, were used for other than artillery service. The Revolutionary ranges were not half those of modern artillery, the mobil-



GATLING ON CAVALRY CART.

The biography of Charles Lamb lies within a narrow compass. It comprehends only few events. His birth and parentage, and domestic sorrows; his acquaintance with remarkable men; his habits and thoughts; and his migrations from one home

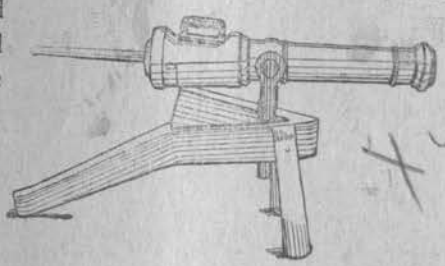
It is a wise and venerable custom in New England to set apart one day in the year for the voluntary commemoration of the divine favour and goodness; and it is pleasing to see so correct a custom gaining ground in our country. Not that in our New England, or any where else, it requires a year to roll over our heads to convince us of the everlast-

ity of guns in action less than half, and their promptness, rapidity, and accuracy of fire far less.

In a train like that of Burgoyne or Cornwallis, the threes, fours, and light sixes would be on galloper carriages, with one or two horses each, and to carry all their ammunition would need a tumbril and a powder cart to a gun. The heavy sixes and larger calibres would be on limbered carriages, with two to four horses or more each, and would require two tumbrils or powder carts each, and a wagon for every two guns. At this rate, Burgoyne had in his artillery train about a hundred and twenty carriages and about three hundred horses, and his artillery train, when closed up, was over a mile long. Burgoyne's artillery, fitted out in the modern way, for similar service, with limbered carriages, ammunition in caisson, and limber chests, would require eight or ten horses for the twenty-fours and large howitzers, six or eight for the twelves, four each for the sixes and small howitzers, two each for the threes and fours, and an equal number for the ammunition, the forges, and the battery wagons; in all, about four hundred horses. The column of route would start about half a mile long, and stretch in marching to about two thirds of a mile.

LIGHT GUN OF 16TH CENTURY.

The modern light Gatling serves about the same purpose as the three- or four-pounder of the Revolution. It weighs, with about five thousand rounds of ammunition, about the same as the three-pounder and its twenty rounds. It is similarly mounted and horsed. It can fire about a thousand rifle bullets a minute for several consecutive minutes, projecting them nearly a mile, with an accuracy which would hit a half-length portrait three shots out of four at five hundred yards. It carries a four-minutes' supply of ammunition for its quickest work. The three-pounder could fire about ten shots a minute, could project round shot half a mile, and mitraille about half as far, and could hit the side of a small church at five hundred yards about half the time with round shot, or a third of its grape.



3-INCH GUN OF CODES, NOW AT ANNAPOLIS NAVAL ACADEMY.
(From photograph.)

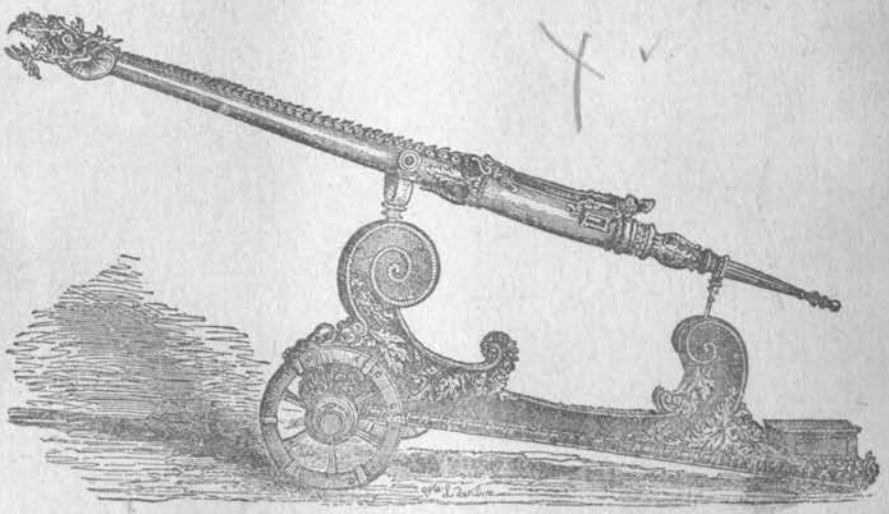
The danger line of the Gatling is, then, about twice as far off as that of the three-pounder, and, as the speed of advancing troops has not very materially increased, the epoch of danger lasts about half as long again, and the numerical chances of injury are in favor of the Gatling as twenty-five to one.

For distant and heavier work, the power of modern artillery is vastly

greater than this comparison shows. The advance in mobility by improvement in carriages is equally great.

Experiments devised and carried out by Mr. A. C. Goodell, Jr., before the Massachusetts Railroad Commissioners in 1881, together with the practice of contractors and Morin's experiments on friction, give in substance this result:

A well-fed, serviceable working-horse weighing about a thousand pounds can draw readily on a broken-stone, gravel-surfaced road in ordinary condition, with slopes of one in fifteen, in a cart with iron axles and well-oiled metallic boxes with oil washers, a load of three and a half times his weight



DRACONCILLO IN MUSEUM OF MADRID. CAST AT LIEGE, 1516.

for a distance of fifteen miles a day, at a walk, never exerting a tractive force of over half his weight, and usually only a fifth. On wooden axles with axle skeans, and bushed wheels lubricated with tar and tallow, the same tractive force on the same road at the same speed, only moves about two thirds of this load. If the road be the ordinary dirt road of the farm or the back country, for the same traction the load must again be diminished by half.

Field artillery must be horsed for the most unfavorable conditions, and only minimum loads imposed. In the time of the Revolution the load was rather more than less than the weight of the horse, and the tractive force produced but two thirds the result of to-day. In short, the artillery horse of the Revolution was called on for twice the duty of his modern successor. We allow six horses to a light twelve which weighs, with carriage and limber, about four thousand pounds, and call on them in campaigns for the work of a gentleman's carriage horses on an afternoon's summer drive, — far less, indeed, than is demanded of a horse in a Concord stage, or a depot barge at a summer watering-place.

On the surrender of Acadia to England, the lakes, the rivulets, the granite ledges of Cape Breton, — of which the irregular outline is guarded by reefs of rocks, and notched and almost rent asunder by the

The earliest books on America contained tales as wild as fancy could invent or credulity repeat. The land was peopled with pigmies and with giants; the tropical forests were said to conceal tribes of negroes; and tenants of the hyperborean regions were white.

The advance from the artillery train of the early years of the fourth quarter of the eighteenth century to the batteries and brigades of to-day is very great; and yet nearly every mechanical part of the present system, including breach-loading, and much of the refinement of organization now employed in artillery, had been satisfactorily tested in war before 1775.

Charles V. of Germany and Spain had invented the limber and had breach-loading guns, mounted on block trail carriages, as early as the beginning of the sixteenth century. Cortes used breach-loading swivels in Mexico, and Henry VIII.'s artillery in 1544 is represented on limbered carriages with breast teams, and consisted in part of breach-loading *mitrailleurs*, or, as they were called then, from the petticoat shield which covered them, *ribaudequins* (*ribaudes mesquines*, "little war wenches"). Bills for the outfit of Columbus in 1492, found recently by Colonel Carrasco, also include *ribaudequins*. Gustaf Adolph had his artillery horsed with breast teams, and driven by enlisted postilions. Metallic axles and boxes had been introduced in French artillery in the middle of the eighteenth century. Limber chests for ammunition had been used a hundred and fifty years before, in the wars of the Dutch Republic. The connection between the fore and hind carriage by a linkage below and behind the centre of the fore axle was a familiar sight in the sling cart of timber yards, and to the artillerist who had used his limber to bring up bridge logs and parapet revetements. And yet, when it was proposed by Captain Congreve to combine them in 1777, the scheme met with such resistance that they were only

THE DIRECTOR BARRAS.
(After a French Lithograph.)

tried in war twenty-three years later, only received French endorsement at the end of fifty years, and became universal only since the Crimean war.

The artillery opposed to Cornwallis and Burgoyne was no better than their own. Indeed, it was only in 1800, in Egypt, that it was first clearly demonstrated that a system of carriages and transport had been devised greatly in advance of what they then had. Artillery, from the date of its introduction until the end of the eighteenth century, was an impediment to an army, necessary, because of the power it gave, but embarrassing, because of the anxiety it caused, and the demand it made on the infantry.

COPPERSMITH.

Since then Ramsay at Fuentes d'Onoro, a Russian officer in the invasion of 1814, Ringgold and Bragg in Mexico, Turner at the Alma, Bigelow at Hatcher's Run, and doubtless many others, have demonstrated that in a pinch, it is a fairly independent arm, capable of sustaining alone the shock of a conflict and fit to skirmish with.

THE GUN FOUNDERS.

Most of the guns are English cast. One is French, one is Chinese.

Where a foundery specially expert in some branch of the art has existed for a long time, managed by a series of masters who have learned their art from each other, and has sent out pupils trained by these masters, who have established other founderies elsewhere, it has been of late customary to speak of the masters as a dynasty, much as we speak of the Bourbons of France, Spain, and Naples, and of the twelve Cæsars, and the Antonines.

BRASS FOUNDER, 16TH CENTURY.
(From J. Amman.)

All the European guns were produced by the same dynasty of artists. It was hoped that some portrait of some one of them could be obtained, but search at Woolwich and at Douay has been fruitless, and the personal memorials obtainable are only their signatures in bronze.

THE BERANGER DYNASTY.

Soon after the city of Douay in French Flanders came into the hands of the *grand monarque*, he took under his patronage the bronze founding

industry for which Flanders had been famous, and established a royal foundery there. Beranger de Falize became director of it in 1694, succeeding Balthasar Keller. Beranger after Beranger succeeded as director for a full century. The Republic, in 1793 and 1794, tried to run the works under an army officer, who made some good guns, but after two years Jean François Beranger was restored, and transmitted the direction to his son Jean Laurent, who resigned in 1822 and went to England, closing his career as one of the master founders at Woolwich.

SIGNATURE FROM MONTAGU GUN.

Before 1716 English ordnance was made by contract. In that year, the ordnance, then under Argyle, determined to establish a foundery, and advertised for a director. Andrew Schalch, a Swiss, trained at Douay, applied for the post, and, after suitable inquiries of his former masters, was engaged at a salary of five guineas a day, and the English branch of the Beranger dynasty was thus established under Schalch, and both branches may be said to have ended at Woolwich in the person of Jean Laurent more than a century later.

While Schalch was waiting the action of the Ordnance, Bagley, a celebrated gun and bell founder at Windmill Hill, one of an English family of bronze workers with branches in three counties, whose work, so far as it has come to us in bells and guns, is good, invited the officers of the ordnance to witness the pouring of two twenty-four pounders. A tradition, recorded in Duncan's "Royal Artillery," relates that Schalch was present and foretold an accident which presently happened.

SIGNATURE FROM SACKVILLE GUN.

Lieutenant Grover relates the official proceeding and ignores the accident. Captain Duncan relates the accident and was not aware of the antecedent proceedings. One thinks the prophecy of an accident had no influence on the appointment; the other that it determined it.

Doubtless there was opposition to a government foundery. Doubtless Bagley, a large contractor, wished to prove the competency of private enterprise. Doubtless a fulfilled prophecy of an accident answered some objections which might have prevailed if Schalch had been wrong. While one may show that the initiation did not arise from the Bagley accident, or even that the determination was independent of it, one can hardly doubt that a reconsideration of the determination was impossible after the wisdom of the act had been proved. One must never ignore a legend in an historical research. It almost always

contains a fact. That Schalch and his friends attributed the origin of the Woolwich gun foundery to his demonstration of fitness for his position in this picturesque way is not unnatural, and hardly more than a romantic exaggeration. The foundery did its earliest work in 1717.

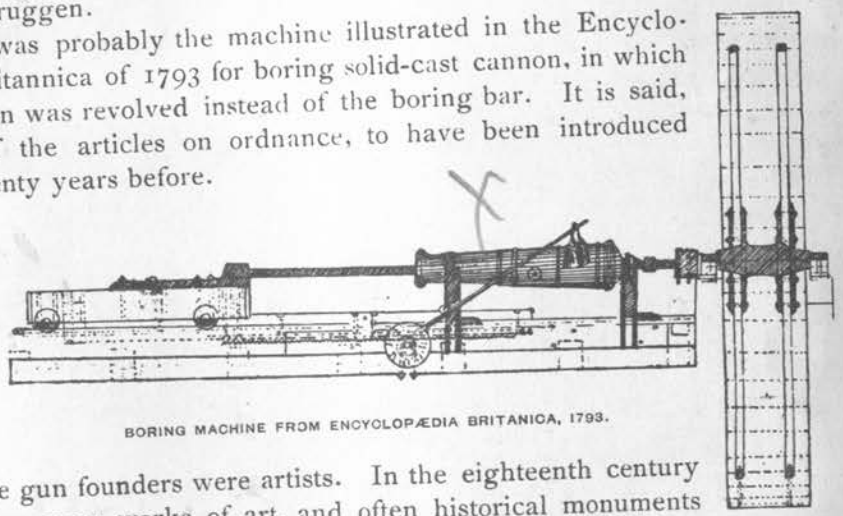
I & P VERBRUGGEN + FECERUNT A° 1770

Schalch served the king for sixty years, and under his administration other modellers worked at Woolwich, and inscribed their names on guns. A gun in the Woolwich arsenal made in 1742 bears the name of W. (William) Bowen, and another in this collection was dated by him in 1767. He was a master workman for a quarter of a century.

In 1760 and 1761 R. Gilpin, who entrusted part of his work to an assistant whose initials were S. R., made two of the guns, one of which is of very elegant design.

In 1770 J. and B. Verbruggen cast a little four pounder. One of these men was an ingenious mechanic, and in 1772, when George III. visited the arsenal, he examined with interest a new boring machine, the invention of Mr. Verbruggen.

This was probably the machine illustrated in the Encyclopædia Britannica of 1793 for boring solid-cast cannon, in which the cannon was revolved instead of the boring bar. It is said, in one of the articles on ordnance, to have been introduced about twenty years before.



BORING MACHINE FROM ENCYCLOPÆDIA BRITANICA, 1793.

These gun founders were artists. In the eighteenth century great guns were works of art, and often historical monuments also. A long and well-executed inscription on two bronze six pounders in the Doric Hall of the Massachusetts State House consecrated to posterity the names of the officers slain at Concord, April 19, 1775. Posterity was so unmindful of this that under an unsentimental militia administration they just escaped the crucible.

France and Spain gave names to their individual pieces. Royal and national or civic arms, ciphers, and badges, and the arms or ciphers of ordnance officers, were embossed on them. The artists signed and dated their work. Mottoes and other emblems were often added. Visitors at the Washington navy yard aften pause to examine the work of Simon Beranger de Doni-

It is a pleasant and impressive time, when at the close of divine service, in some small country church, there takes place the gentle stir and preparation for a baptism. A sudden air of cheerfulness spreads over the whole congregation; the more solemn expression of all countenances fades away; and it is at once felt that a rite is about to be performed, which, although of a sacred and awful kind, is yet connected tenderness over the domestic relations, and makes them, who hold up their infants to the baptismal fount, better husbands, fathers, and sons, by the deeper insight which they then possess into their nature and their life.

The minister consecrates the water; and, as it falls on his

court in the two elaborate eighteen pounders in front of the commandant's office, "Le Vigoureux" and "Le Belliqueux." They were cast in 1740 by a pupil of Beranger de Falize or of his son Nicolas Jean, a fellow-workman of Schalch's. The morganatic ancestry of the Grand Master of Artillery, Count d'Eu, is betrayed by them. The sunburst badge of Louis XIV. and XV. is on them, and the label of the goods, "*Ultima ratio regum*" (royalty's last argument), and the arrogant device "*Nec pluribus impar*" (successful against odds). Chaplets of leaves replace some of the usual mouldings. Nothing so elaborate is here. There is enough, however, to show the artist's love for his work.

Even the hoisting loops are modelled and chased into the semblance of dolphins, and the powder pans assume shell forms good enough for a salière or benitier in wrought silver.

The highest technical skill was required for the work. The mixture and manipulation of the metals must be exact and temperatures carefully observed to avoid oxidation and separation of the alloy. Lack of proper precautions, and official ignorance of the consequence of the neglect, caused serious defects in the column of the Place Vendome, and for a time the artist's reputation was gravely compromised, and he contemplated an unpleasant perspective in which the assizes and the galleys were prominent features, and all because the metal of old guns of uncertain composition would separate and slag in remelting.

The appliances for external finish and for boring were extremely rude. No lathe sturdy enough to swing a gun then existed. The slide rest was not invented. Sometimes it was set on its cascable as a pivot and bored by a drill driven by horse power. Sometimes it was laid in bracket rests and slowly revolved. Intense attention was demanded of the superintendent. Count Rumford, shortly after the American revolution, laid the foundation of the doctrine of conservation of energy while observing such work, for he was led to suspect a definite ratio between the work of the horse and the temperature of the water which cooled the gun and the tool, and his publication led to the generalization stated by Tyndall, "Heat is a mode of motion."

The plain parts of the exterior of the piece were filed or stoned to circular cross section. The arms and ciphers were chased up with delicate chisels, matts, scrapers, files, and rifflers. The workman made most of his own tools.

No great alteration in the tools and appliances of the brass founder, the coppersmith, the brazier, the whitesmith, took place between the sixteenth and the eighteenth century, and the shops of these workmen are illustrated by Amman, whose cuts have been copied.

WHITESMITH.
(After Amman.)

Personal or traditional experience was the only source of technical knowledge. The apprentice learned trade secrets from his master, and from his fellow journeymen from abroad. These were so occult, and their acquisition required so much acumen, that men spoke of the artisan as practising a "craft" or a "mystery."

Technical treatises on the constructive arts were few and meagre, but the destructive art of war possessed many manuals. England early in the eighteenth century led by the publication of a somewhat pretentious technical dictionary. The French encyclopædia was projected only in the middle of the century, and the text was not complete till 1767. The French government could shut its eyes to the publication of Mirabeau's prison-written novels and of Louvet's study of high life, but persecuted d'Alembert and Diderot for trying to popularize science, and forced the latter to get some of the means for prosecuting his work of civilization, by writing works of the permitted style. The eighteenth century forgave la Pompadour for patronizing industry in the interests of luxury and display. It did not pardon Frederic of Prussia for similar work in the interest of the industrial development of Prussia.

These things to some degree explain why Schalch's pay was as high as a general officer's. His skill was exceptional.

When the marks and emblems on a gun call our attention to a distinguished subject, it will be convenient to name the piece from him, and we now inquire of the weapons what they can tell us of men and things.

THE HERALDRY OF THE GUNS.

A name written out in letters, a date in words and figures, are easy things for everybody to read. There are, however, other indications of names and dates equally significant, invariable, and intel-

THERE is an event which happened just before our arrival in Switzerland, of which no particular account may have been printed, and which I think cannot be uninteresting, especially to those of our friends who have visited this charming country. Indeed it is too disastrous to be told

passing of the swell. A large house in this village was lifted off its foundations and carried half a mile beyond its place. The hermits were absent on a pilgrimage to a distant abbey.

ligible, such as national or personal arms, badges, or ciphers, of which the modern monogram is a variety.

We all know the present royal arms of Great Britain with their four panels or "quarters," two of which display three prowling lions for England, one a rampant lion within a double rubric with scroll-work here and there, called a tressure, for Scotland, and the other a harp on a blue ground, for Ireland. These royal arms have not always been used. Edward III. indicated his claim to the French throne by quartering the *fleurs de lis* of France with the English lions, and these gold lilies on a blue ground continued in the English arms till after the peace of Amiens, when they were abandoned to please General Bonaparte. Scotland and Ireland were introduced in the composition by the Stuarts. Before Victoria, the standard of the Irish harp always appeared as a sculptured female bust. The arms of William and Mary and William III. differ from those of earlier and later monarchs. Queen Anne and the Georges before 1801 united England and Scotland in the first quarter as a symbol of the parliamentary union of 1707. From 1714 to 1837 the arms of Hanover appear, but they are differently arranged at different periods. For nearly a century the Elector of Hanover was King of England.

SCHALCH'S ROYAL ARMS, 1727.

Schalch's Montague Cypher 1740 from a Painting

Hanover was a small German nationality composed of three duchies, — Brunswick, the arms of which were two gold lions on a red field; Lunenburg, whose emblem was a blue rampant lion on a gold field spangled with hearts; and Westphalia, a white horse running on a red field. Their sovereign was also the Arch-Treasurer of the empire, and the jewel of his office displayed the gold crown of Charlemagne on a small red shield. His sovereignty was indicated by putting this in escutcheon over the point where the corners of the three ducal panels met.

An elector was all but a king. He was a Highness, but not a Majesty. He had a court, sent embassies, maintained an army, but he lacked a crown. His official head-gear was neither a coronet nor a cap. It had the arches

and cross which indicate dominion; but instead of a jewelled circle it had merely a band of ermine, and was called a "bonnet." Most serious of all, he was neither imperial nor royal: he was only serene.

Fashion decided at one time that badges were the proper thing, and we find the rose, thistle, shamrock, portcullis, bear and staff, chained swan, and other emblems used in England, the porcupine, the salamander, the three twined crescents in France, and all these can usually be assigned to persons and periods. Again, fashion sometimes prescribes ciphers, and the style of letters, the way of intertwining them, and the use of accessories furnish clues to dates.

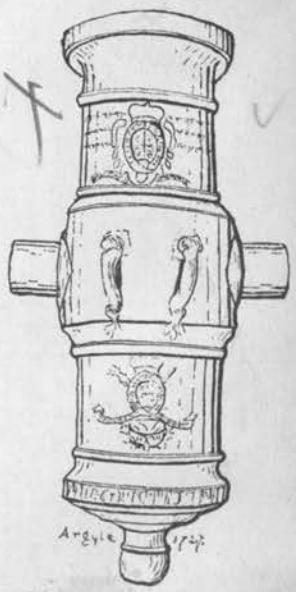
There are examples in this park of all three of these arbitrary methods.

SCHALCH'S ROYAL CIPHER OF 1748, FROM THE MONTAGU GUN.

THE ARGYLE HOWITZER.

Length, 5 feet 10.8 inches; calibre, 8 inches; weight (marked), 15-0-4 (1684 pounds); No. 7. Dolphin handles. Shell touch-pan.

The royal arms of the eighteenth-century Georges are on the chase. They are surrounded by the garter, with its motto, "*Honi soit qui mal y pense*," and beneath them is the device "*Dieu et mon droit*."



These arms were only used between 1714 and 1801.

Upon the re-enforce, arranged as an ornament to the powder-pan, is another coat-of-arms. A coronet surmounts it, adorned with strawberry leaves, and shows that it belongs to a living duke. A rod of office tipped with the royal crest of Scotland runs slantwise beneath the shield, and shows him to have been a Scotch palatine, and a two-handed sword which crosses it is an emblem of judicial authority. The garter surrounds the shield, and there is a motto scroll below it with the words "*Vix ea nostra voco*" (I hardly call these things my own).

On the shield itself are four quarters which display the gyrons of Campbell and the lymphad of Lorne. On the breech-band of the piece are the words "*A. Schalch, fecit* 1727."

Only one man could answer the requirements of these arms, — John, the

Maccallum-More, head of the house of Campbell, second Duke of Argyle, first and only Duke of Greenwich of his family, Grand Justiciary of Argyleshire, Grand Master of the Scottish Household, Knight of the Garter, Master General of the Ordnance. His frequent resignations of office make his motto significant.

Argyle received his early military training in the Scotch Life Guard. He served under Marlborough in the Low Countries. At the age of thirty he commanded a brigade at Oudenarde. In 1709 he sufficiently added to his reputation at the "very murdering battle" of Malplaquet to be sent next year to Spain, to command in chief. Marlborough seems never to have liked him, but it is not known why.

In the summer of 1714 Argyle was in England. A Jacobite intrigue for restoring the banished Stuarts was under way, with Bolingbroke and Atterbury at the head of it. The cabinet was dissolved July 27. The council met on the 28th. Had not the Queen been struck with apoplexy that morning, there is little doubt it would have been asked to advise a Jacobite cabinet, with Bolingbroke in the foreign office, Atterbury as privy seal, and Ormond at the head of the army. Then, on the demise of the crown, the only hope for a free England would have been in civil war, with all the powers of the government in the hands of those who wished to subvert the act of settlement. The scheme was promising. Marlborough was in Holland. Ormond, though no great soldier, was popular. Cadogan's position in the state did not make him formidable. Webb, Cadogan's rival and cordial hater, was probably as good a general, inferior perhaps as an engineer, but better as a tactician. He had more popular manners, was a Jacobite, and was a favorite of the troops. Possession of the government machinery was of prime importance.

MARLBOROUGH.
(After Kneller.)

At this crisis, two Whig dukes, Argyle and Somerset, one Scotch, one English, attended the council unsummoned, and by preconcert with the President, Shrewsbury, moved and carried the recommendation that Shrewsbury should be Treasurer, and that a full council should be summoned. On the 31st the Whigs attended and took control of affairs, ordering to London troops with commanders loyal to

the Hanover succession. When the Queen died, on August 1, as a sequel to this action, the dynasty of the Guelphs was peaceably set up.

From the death of Queen Anne till the arrival of George I. in September, Argyle was one of the Lord-Justices who held the executive power.

ARGYLE.
(After Kneller.)

When the Earl of Mar mounted the white cockade and set up the royal standard of the Stuarts, Argyle went to Scotland as Commander-in-Chief. The situation needed a soldier, a statesman, a politician. The force at his command was two hundred dragoons of the Scots Greys, and a thousand foot, who held the passage of the Forth at Stirling. Mar had eight men to his one. Their clan traditions and Highland habits had made them half-formed soldiers before they took the field. An English insurrection menaced Argyle's communications. Time was needed to recall troops from the continent and to discipline new levies. Interposing recklessly, if he had not known his opponents, between two bodies of Mar's forces, Argyle out-manœuvred the superior forces of Mar and MacIntosh, and saved both Stirling and Edinburgh. Being reinforced to about three thousand men, of whom over a third were cavalry, he brought on a battle on the Sheriffmuir, a field on which he could avail himself of all his preponderance of horse, and where the impetuous Highland infantry must be at disadvantage. He led the charge himself, and routed half of Mar's army. His infantry were not so fortunate, and while Argyle was winning on the right, two thirds of his left and centre were dispersed or slain. He was advised of this when nearly three miles from the field of formation. To the dismay which this repetition of Prince Rupert's tactics of battle spread through every heart, he opposed a cheerful face and a light demeanor, and sang in the hearing of his soldiers the couplet, —

"If it wasna weel bobbit, weel bobbit, weel bobbit,
If it wasna weel bobbit, — *we'll* bob it again."

Without delay he led back his horse, collected the remnant of his foot, and seeing Mar strongly posted on a hill with his victorious troops, formed forward to attack, up hill, against odds of two to one.

The duke's condition was described by one of Mar's officers thus: "Had we rolled down stones upon them, they must have been destroyed, so weak

This offer was accepted by James with warm expression of gratitude. Having made these arrangements, he requested the States General to send back the six regiments. The States General, completely governed by

British Protestants would excite alarm and disgust at Madrid, Vienna, Turin, and Rome. For this reason the Prince long abstained from formally expressing his sentiments. At length it was represented to him that this

and spent were they." At that moment the Stuart cause needed "one hour of Dundee." Dundee was dead. No Jacobite present had learned the "grand war" under Marlborough, and no Scotch Jacobite present could have submitted to the command of a foreigner, or any other than a native nobleman of the highest rank. Mar retreated. The star of the Stuarts never again shone with equal lustre. The feudal traditions of the Highlands which brought out the clans in force were the strength of the Stuarts. Those same traditions made the clans tenacious of positions in line, and insisted that the social hierarchy should prevail in army matters. These traditions, therefore, while they strengthened the component units of the army, weakened its solidarity and dislocated its strategy and grand tactics.

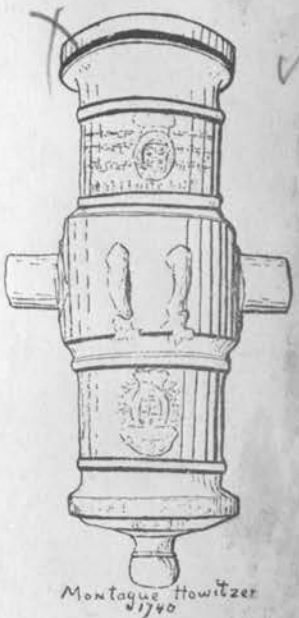
Argyle, like a shrewd politician, waited for the character and customs of the Highland army to sap its power, by dispersing the soldiers to winter with their families, and by sowing dissension among the chiefs in a long inaction. He even refrained from pushing the rebel army to an engagement when it decamped from Perth, but allowed it to break up, on the desertion of the Chevalier, and retire to the Highlands. He then blocked up the passes and left the rebels alone. He did not tempt the government to a bloody assize by taking many prisoners. His policy foreshadowed Pitt's, to use the strength of the Highlands for the Crown, and not allow the active spirits, lacking an honorable opening under government, to intrigue for revolution. Wade, in pursuance of the same policy, organized the Highland police companies (Freicudan-Dhu), late the nucleus of the famous 42d regiment, which still preserves the history of its origin in its familiar name, the "Black Watch."

It was a sequel, perhaps a result, of this policy, that the *acts* of Scotland were loyal for thirty years. The rising of 1719, though it had stronger foreign support than that of 1715, was very feebly encouraged in Great Britain.

Three times in Argyle's career he differed with the policy of the government of the day and resigned his appointments. His voice was always

heard in favor of moderation, and any act of oppression or injustice to Scotland or Scot met his vigorous and efficient opposition. Beyond the Tweed, men called him the good duke. Sir Walter Scott has left a pleasant sketch of him in the "Heart of Midlothian." Pope respected his parts when he wrote, —

> "Argyle, the state's whole thunders, born to wield,
> And shake alike the senate and the field."


Montague Howitzer 1740

When Queen Caroline, in her first anger over the Porteous mob, threatened to make all Scotland a hunting field, he proposed, with grim humor, to go home to get his hounds ready.

Lord Mahon, the historian, with a fine hereditary hatred, calls him fickle and selfish, and attributes nearly all his changes of political relations to hopes of personal advantage. Even when Argyle, in 1740, joined with Stanhope, to the approval of Lord Mahon, this censor grudgingly commends him in these words: "In so long a life, it is not impossible that for once he might deviate into disinterestedness."

Proud to the verge of vanity, an independent thinker, feeling himself of competent ability to direct affairs, to control events, and to criticise with the authority which commands rather than persuades, polished in speech and cogent in argument, he held his own position as a great noble, head of Clan Campbell and chief of Scots, to be one which was above party, and untrammelled by any allegiance save to the throne. The object of his life was to reconcile Scotland to the act of settlement, and to make of two nations, one. Argyle well knew that nough thut justice


BERNADOTTE,
(After Bonneville, 1797–8).

NOTE TO PAGE 11. The single positive assertion of Bernadotte's presence in America is, considering the situation, of paramount weight, above any amount of silence in his biographers. Jourdan in 1794 conducted the war on the Sambre. More of the soldiers of Rochambeau and sailors of DeGrasse were in that army, and more of the traditions of America were there, than in any other of the French armies. Marshal Ney was in a position to know the facts and traditions current in 1794 on the Sambre, and to fail to report a lying gasconade. When his memoirs were published after the Revolution of July, the statement met no contradiction. The few words are pregnant with the assertion that in 1794 that part of the French army most familiar with the reports of French prowess in America, the men who had campaigned with Lafayette, Rochambeau, Laurun, Custine, Jourdan, believed that Bernadotte had been a soldier in America, had given evidence of notable military capacity, enough to furnish anecdotes for the biographical myth which collects around every able officer in every notable service. They are pregnant also with the fact that in 1794 Bernadotte himself encouraged the belief, and concurred in spreading it, and did not contradict it before the time of the Empire, for Ney's memoirs were written just about then. That this belief afterwards fell into oblivion as a fact inconvenient to the Crown Prince and King of Sweden may account for its absence from Bernadotte's biographies.

Ney writes (Memoirs, Book I., chap. 5): "Bernadotte ménait son avant-garde. Bernadotte récemment promu au grade de général, réunissait au courage si commun, à l'armée de Sambre et Mense, l'expérience qui était rare encore. Soldat depuis quartorze ans, il avait fait la guerre en Amerique comme en Europe. Il avait acquis sur la Delaware comme sur la Sambre ce coup d'oeil rapide, cette prestesse de manœvre que peu de ses collègues possédaient alors."

d moderation could do this. No Hanoverian and no Englishman of those days could appreciate the passionate Scots' loyalty to hill and brae, to family and clan, to the Scottish regalia and Mons Meg. To convert this loyalty into a broader loyalty to the United Kingdom, was the only hope for stable and free government. Argyle's acts, read in this light, are acts of lofty patriotism and sagacity.

What might have been hoped of Ireland if, for sixty years, that country had had a great and good friend like John, Duke of Argyle!

When Marlborough died in 1722, Argyle got the Ordnance. He lost it in 1740, was re-appointed in 1742, and threw it up again in the same year. He died in 1743. His successor in 1740 and 1743 was the Duke of Montagu.

THE MONTAGU HOWITZER.

Measurements, calibre, and general description as in the Argyle howitzer. Weight (marked), 15–1–2 (1710 pounds), No. 7.

Royal arms the same, but slightly different in design.

When the Duke of Argyle went into opposition in 1740, the public records of England show that he resigned all his posts save that of Master General of the Ordnance. Some, if not all, of the archives where this should appear are missing. Duncan, historian of the Royal Artillery, argues the Ordnance resignation as inherently probable. It is, however, certain that Argyle was Master of the Ordnance just before his death, and Lord Mahon is explicit that he was reinstated in 1742.

The missing record of the resignation of 1740 is in Fort Monroe. On the breech-band of this howitzer one reads, "*A. Schalch, fecit* 1740." It is embossed with the arms of a new master.

Hard by the powder-pan, where the arms of Argyle were placed in 1727, there is a quartered shield, ensigned with a duke's coronet, and charged with the "*fess fusillée*" within a bordure, of Montagu, and the green eagle displayed, of Monthermer. Around the shield, as before, is the buckled motto riband of the Garter, and outside that is a chain of sceptres twined with rose, thistle, and shamrock, of knots and crowns, which used to be the collar of the Bath, and now is the collar of the grand crosses of that order.

The family motto below, "*Spectemur agendo*," lends itself to many meanings. For an industrious statesman, for a notable soldier, the English of it would be, "Conspicuous in service." For an adroit politician, it might be rendered, "Noticeable as a worker." For an indolent man of considerable parts but of little energy, a characteristic translation would be, "Remarkable if employed."

These arms and emblems refer to John, Duke and Earl of Montagu,

Marquis and Viscount Monthermer, Baron of Boughton, Knight of the Garter, Grand Master of the Bath, Master General of the Ordnance. He was at that time head of one of the great families of England. He was the son-in-law of Marlborough. He founded the English artillery school at Woolwich, which has for nearly a century and a half observed, studied, and transmitted the essays at improvement by artillery officers, in arms, organization, tactics, and fortification, and the lessons taught by trial, with a pure scientific spirit, with an appreciative zeal for the improvement of the military art and the perfection of their own arm, with a catholic appreciation of the good, and a sound synthetic judgment, that made, early in this century, the English Royal Artillery the pattern of the world, a model universally copied; and which has kept it advancing ever since, abreast of the times always, ahead of them generally. The work of the English artillery has been unostentatious, independent in direction, efficient and thorough in method, and satisfactory in results.

BRAZIER, 15TH CENTURY.
(After Annan.)

Lord Montagu's school collected and associated the personal experience and observation of individuals, into a coherent, scientific unity, under the independent criticism of men of a common martial education, whose warlike services had been as diverse as the climates of the globe, and as varied as the nations of humanity, and thus made the acquirements of each a fund of knowledge common to all.

MONTAGU.
(After Kneller.)

Far back in English history the Montagus, Earls of Salisbury, were a great family, and a ball-room accident to one of the ladies of the house is associated with the founding of the order of the Garter. This line was so completely destroyed in the wars of the Roses, that since the accession of the Tudors no one has claimed the earldom.

Under Henry VIII., a Montagu, claiming affinity to the former great family, was Chief Justice of the Common Pleas and of the King's Bench. He shared handsomely when the abbey

lands were distributed. He drew the will of Edward VI., which undertook to set aside the parliamentary settlement of the crown on Mary and Elizabeth and to enthrone Lady Jane Grey. Yet under Mary he managed to retain his estates granted out of church lands. It was for him that the quaint picture at Cowdray was painted, full of the details of costume, armament, and manners, from which the representation of Henry VIII.'s artillery was taken.

UNION BADGE, BY SCHALCH, 1740.

This chief justice left a numerous progeny, which soon began to rank as one of the "Great Governing Families of England." He made each of them a man of estate and county position. At the end of a hundred years Pepys records that over four thousand persons, then living, were descended from him. The grandson of this chief justice became Lord Montagu of Boughton; from another grandson descended the admiral of Charles II. and James II., patron of Pepys, and first Earl of Sandwich. Another grandson, under James I., was Chief Justice of the King's Bench, and ancestor of the famous parliamentary general, the Earl of Manchester, whose descendants have been promoted to dukes. From another branch came Montagu, Earl of Halifax, the financial minister of William III., Anne, and George I.

ROYAL CIPHER, BY SCHALCH, 1740.

William III. promoted Montagu of Boughton to be Viscount Monthermer and Earl of Montagu, and Queen Anne promoted the earl to be a marquis and duke.

John, the second Duke of Montagu, married Lady Mary Churchill, daughter of the first Duke of Marlborough. As usual among the great nobles of that day, he saw some military service, and had military rank.

On the accession of George I., though Marlborough was restored to his posts of Captain General and Master of the Ordnance, he was allowed no influence in the government and no patronage in the army. His sons-in-law, however, were provided for, that they should not go into opposition. Montagu got the parade position of Constable at the coronation, and the more profitable place of Lord Proprietor of St. Lucia and St. Vincent.

MONTAGU CIPHER, BY SCHALCH, 1740.

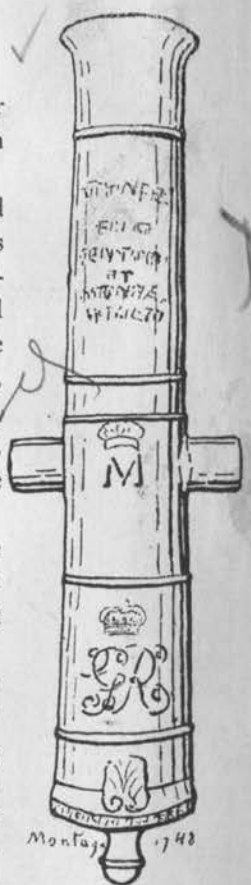
When Argyle laid down his places in 1740, and when he died in 1742, John, Duke of Montagu, was appointed Master of Ordnance, and the *fess fusillée* and green eagle began to adorn the cannon of England in 1740.

Duncan could not find the fact of his first appointment in 1740. But this howitzer is a monument of it. It was once said of the Garter that there is "no pretense of merit in it." Montagu was a Knight of the Garter. In 1725, however, when the King desired an order to reward merit and service, he revived the Knights of the Bath as a permanent order, and

made Montagu Grand Master. The duke proudly associated the ensigns of the Bath and of the Garter with his family arms.

During Montagu's administration, the current French fashion was introduced of using ciphers instead of arms upon guns, and this collection affords two early specimens of it.

THE MONTAGU GUN FROM SARATOGA.



Length, six feet one inch; calibre, twenty-four pounder; weight, 16-1-24 (1844 pounds), No. 5. On base ring, "*A. Schalch, fecit* 1748."

Upon the reinforce is a crowned G 2 R cipher, and on the trunnion band a Roman M ensigned with a duke's coronet. It was desired also to make appropriate reference to the Grand Mastership of the Bath. The special badge of this order, on collar, cross, and medal is the sceptre twined with rose, thistle and shamrock. Schalch, with true artistic feeling, utilized for the sceptre of this badge the muzzle-sight of this piece, now broken off, and incised the national emblems in the metal of the gun, around the base of the muzzle-sight.

Montagu held the place of Master of the Ordnance till his death in 1749; so that we have at Fort Monroe a specimen of the work done in his first and in his last year, 1740 and 1748.

No other master was appointed till 1755, when Charles Spencer, second Duke of Marlborough, son of the great duke's third daughter, succeeded him. During most of Montagu's incumbency, the Lieutenant-General of Ordnance was Marshal Wade, who had commanded in Scotland after the rebellion of 1715. He was a practical engineer of great common sense, and by pushing good military roads into the Highlands, not only made it easier to repress a revolt if it occurred, to maintain, supply, and reinforce the detached outposts in the hill country, and to employ cavalry there to some extent, but gave to civilization an opportunity to extend northward, and thus lessened the chance of revolt. This politic and strategic prudence would probably have been forgotten ere now, had it not been celebrated in the absurd but still intelligible couplet, —

> "Had you seen these roads before they were made,
> You would lift up your eyes and bless Marshal Wade."

When Wade died, in 1748, his successor as lieutenant-general was Sir John Ligonier, under whose administration three pieces in this park were cast.

The town residence of Montagu was built by his father, and was too

expensive a luxury for his heirs. Montagu's daughter married a Brudenell, Earl of Cardigan, who was created Duke of Montagu, and on his death Montagu's house and its grounds were sold to the nation, to receive the collection of the British Museum.

One gets an excellent idea of the vast estate occupied by the duke, in what is now the heart of London, from George Warrington's letter to Quebec, in Thackeray's "Virginians." We are told that the gardens behind the house commanded a fine view of Hampstead, that they were open to the public quite early in the morning, that they were sufficiently secluded, unfrequented, and unpaced to furnish a good duelling ground, unless an information were laid at Bow Street.

These two old howitzers present an exceptional metallurgic feature, which may also have existed at the muzzle-sight of the gun.

The rimbases of the trunnions are of iron, and are evidently in fused union with the bronze of the body of the piece. They are much corroded. The use of iron rimbases for bronze guns must be rare, and is probably traceable through Flanders and Spain to Morocco, and thence back to Assyrian, and perhaps Hittite, practices.

THE LIGONIER GUN AND HOWITZERS.

One artist and two masters general, in twenty-one years, have given us three guns. One ordnance officer and two artists, in six years, are now to give

us three more. The Ligonier gun is a singularly graceful light six pounder. It is marked on the base ring "*R. Gilpin, fecit* 1761." Calibre, 3.7 inches. Length, 4 feet, 11.3 inches. Weight, 4-3-14 (546 pounds). On the reinforce is the royal cipher G 3 R, and on the chase is a script L beneath a viscount's coronet, with seven pearls only, an unusually small number. All the ornaments of this piece are full of life.

The howitzers are light twenty-fours, of a sort called "Royal." They are crudely modelled. The trunnion band is clumsy and devoid of style. The royal ciphers lack spirit. The shell touch pans look starved.

Bowen had indeed a happy conception for the master's cipher — an initial in a circular cartouche, framed by the motto fillet of an order. It was, however, an unpardonable solecism for him to inscribe the motto of the Bath on the peculiar ensign of the Garter.

One Royal is marked on the base ring "*W. Boen, fecit* 1755." Calibre, 5.8 inches. Length, 2 feet, 7.2 inches. Weight, 4-0-18 (466 pounds). On trunnion band, G 2 R cipher. On chase, a Roman L within a garter inscribed "*Tria juncta in uno*" (three united in one) No. 6.

The other Royal is marked on the base ring, "*R. Gilpin, fecit* 1760."

Calibre, 5.8 inches. Length, 2 feet, 9.6 inches. Weight, 4-0-16 (464 pounds). On trunnion band, G 2 R cipher. On chase, a Roman L within a circular fillet inscribed "*Tria juncta in uno*," surmounted by a viscount's coronet with seven pearls.

John Louis Ligonier was a French Huguenot, born in Languedoc.

It is a little singular that in his case, as in Argyle's, there is doubt as to the year of birth, whether 1678 or 1680. The balance of authority in both cases is for the earlier year. Argyle died in 1743. Ligonier died in 1770. Argyle was a brigade commander in 1708, at Oudenarde. Ligonier first had a general's command in action at Dettingen, in 1742. Argyle commanded in chief in the rebellion of 1715. Ligonier was chief of staff in the rebellion of 1745. Ligonier did not really have scope to use his talents till Argyle had worn out ambition, grown weary of honors, and was about to die. Had the rules of the American service to-day been applied to Ligonier, he would have landed in the retired list before his appointment to the Ordnance.

Part of the Huguenot exodus was directed to England, and some of the exiles entered the English service under William III. They were largely employed in Ireland, and with Irish troops.

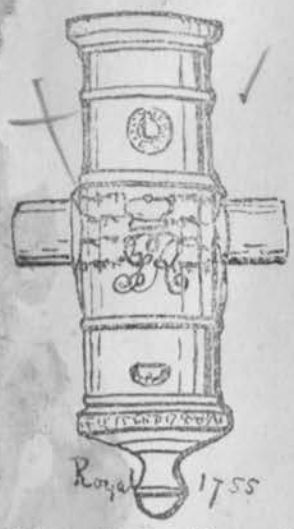
Ligonier and his elder brother, Francis, whose son, Edward, inherited the general's title and much of his fortune, arrived in England in 1697. He served as a volunteer in 1702, and led the stormers at Liege, on October 23. The next year he purchased a company in Lord North's regiment, and in 1704 went on campaign with Marlborough. He helped to rush the Schellenberg, and fought at Blenheim. At the close of that battle he was the only surviving captain of his regiment.

BOWEN CIPHER, 1755.

He was at Ramillies and Oudenarde, but probably was not engaged in the last action, and at Malplaquet. From the fact that his monument calls this battle *Malplaquet Taisniere*, it has been surmised that he was in the flanking column of General Withers. At any rate, he was under fire, for twenty-two bullets struck his clothes or his horse, but left him unscathed.

At Malplaquet, on the French side, the most strenuous squadron leader was a British refugee, the old pretender, called not only at the French court but by many Englishmen, King James the third. On the English side, there was no more skilful and enterprising cavalry officer than the French refugee, Major John Ligonier. As Villars' routed left was driven

ack from the wood of Tanière, on one of the bloodiest of the carnage-soaked fields of Flanders, this unthroned English king, at the head of the household troops of his hereditary enemy of France, valiantly and vainly strove with the disaster wrought by his lost subjects, led on with fiery zeal by the fellow-countryman of his own troopers, the exiled Ligonier.



There at the close of day, the favors of victory, so bravely woed by each that each deserved them, were won by English courage instead of French chivalry, and worn by the French exile to Britain, not by the British exile to France.

George I. had been a brigade commander at Oudenarde, and soon after he came to the throne, Ligonier was sent as colonel and adjutant-general with Lord Cobham on the Vigo expedition. In another year he was made colonel of the fourth horse, afterwards the seventh Dragoon Guards. In 1735, he was promoted to brigadier, appointed aid to the king, and chief ranger in Ireland. About this time, he became military tutor to the Duke of Cumberland. His services in forming Irish recruits into cavalrymen were particularly noticed and prized. In 1739 he became a major-general.

At Dittingen, in 1742, he was chief of cavalry, and for gallantry in action got the red ribbon of the Bath, and was made a knight banneret under the royal standard, the last occasion on which an English sovereign has been able to confer that rank on land.

He had now reached our retiring age. But his great service had just begun. In 1743 he became lieutenant-general.

At Fontenoy, in 1745, he was chief of staff to the Duke of Cumberland, and led on the terrible British and Hanoverian column which came so near to victory, but was at last shattered, though not broken, by Richelieu's guns, to which they could not reply, and by the charges of the French king's household, and of the Irish brigade. Even at this crisis Ligonier did not despair, and refused to withdraw without a written order. Before he began his sullen retreat, he wrote a personal letter to De Saxe entreating his good offices for the wounded. In the fall of the same year, he commanded or served as chief of staff at Litchfield and Culloden. Next year he returned to the Netherlands as commander of the English contingent. He fought at Racoux this year under Prince Charles of Lorraine, who was defeated.


GILPIN CIPHER, 1761.

In 1747, he became general of horse, and commanded the cavalry at Laufeldt or Maestricht. This was his last battle. He was sixty-nine

years old, but he had the fire of youth still. With twelve squadrons of British horse he charged and routed twenty-five. Marshal Saxe declared afterwards that Ligonier had defeated all his projects. Having engaged himself too far, his command was much maltreated and forced back, and he himself surrounded. Perceiving a single squadron of the Inniskellens still in order, he attempted to reach it by pretending to be a French general officer, and assuming command of, and giving orders to, the French troops, intending to attack with one squadron, ten fresh ones just coming up. One Guillaume Pierre detected him by his crimson ribbon of the Bath, and took him prisoner. So grateful was the French nation for this, that in 1792, on January 8, the assembly decreed a payment of 7000 livres and a pension of 150 livres to this man, because the talents of Sir John Ligonier made him a very important prisoner. It is also said that the descendants of his captor assumed the name of Ligonier, and won some additional laurels in subsequent French wars.

After capture, Ligonier had interviews with Saxe and with Louis XV., and as a result of these interviews he was sent back, and negotiations were opened which ended in the peace of Aix la Chapelle, early in 1748.

While Ligonier was the chief of staff or assistant to the Duke of Cumberland, the military career of this prince was uniformly glorious, and though defeated at Fontenoy and Laufeldt or Maestricht, it was with so little advantage to his adversaries that those two actions are the only ones which at all detract from the fame of Maurice de Saxe. When the Duke of Cumberland worked without Ligonier, he was defeated at Hastenbeck by d'Estrees, and forced into the convention of Closter-Seven by Richelieu, who rivalled Louis XV. as a *vaurien*. Mere inferiority of troops will not explain this, for the convention troops afterwards made a splendid record at Minden.

GILPIN'S CIPHER OF 1760.

It seems no more than justice to say that next to Marlborough this Huguenot refugee was the best of English generals of the eighteenth century, and the only fit opponent to Maurice de Saxe during his period of command.

When Wade died, in 1748, Ligonier succeeded to his preferments of Field Marshal, Lieutenant-General of the Ordnance, and colonel of the Second Dragoon Guards. In 1753, he became colonel of the Blues.

William of Cumberland resigned the Captain-Generalcy after Closter-

Seven in the fall of 1757, and Ligonier, in the last part of the year, succeeded the duke in his military posts, Commander-in-Chief at Horse Guards, and colonel of the first or Grenadier regiment of foot guards.

This old man of seventy-nine gave an efficient administration. It is a little uncertain whether he continued as Lieutenant-General of Ordnance from this time till July 3, 1759, when he was appointed Master General, still being Commander-in-Chief, but it is probable that he did, performing his duties by deputy.

RSHAL SAXE.

Relief plate by [illegible] Company, from De Marcinet's engraving after Sistard, 1766.

He was a member of the Grenville administration of 1763 and Commander-in-Chief till the Rockinghams came in, in 1765. The Marquis of Granby succeeded him in both offices.

In 1757, he was made Baron and Viscount Ligonier of Enniskillen, in the Irish peerage, with limitation to the heirs of his body, and in 1762, Viscount and Baron Ligonier of Clonmel, with remainder to his nephew Edward. When he lost the Ordnance to Lord Granby he was created Baron Ligonier of Ripley, in the British peerage, and when he lost the captain-generalcy he became Earl Ligonier, in the British peerage. His public life ceased when he was eighty-seven, but he lived till 1770, and was buried in Westminster Abbey.

LOUIS XV.
(After Duvivier.)

Although in nineteen pitched battles and twenty-three sieges, he was never wounded.

During nearly all the time he was Commander-in-Chief and Master of Ordnance, England was engaged in active war, sending armies to the four quarters of the world, and dealing efficient blows at the power of France under the fiery impulsion of Pitt. The recruitments, transfers, promotions, assignments, inspections, and outfits of the troops for all these years were supervised or ordered by this veteran of four score, to national satisfaction.

Much indignation was expressed when he lost the Ordnance, and more when Lord Granby, who was forty-three years old, replaced this veteran of twice his years at the Horse Guards. Chesterfield wrote, in 1766, "It was a shame to put such a boy as Lord Granby over the head of old Ligonier."

In all this long and active life Ligonier was true to his chosen motto, "*Ardor et Victoria*" (Zeal and Victory).

One *bon mot* is recorded of him. When Lord George Sackville, after his return from Germany, was complaining bitterly of his dismissal without a court martial, Ligonier exclaimed, "Court martial! if you want that, go back to Germany."

LIGONIER AT 82.
(After Reynolds.)

An excellent story is told of Earl Ligonier by Dr. Doran in his book on court fools, in the chapter on "Kings who were their own fools." But the hero of it was the marshal's nephew Edward, second earl.

Lord Ligonier left much of his property to this nephew, but provided handsomely for his mistress and natural daughter, through whom he has some posterity.

It has probably been noticed that the historical appendages to the large pieces were arms, and on the light guns ciphers. This may or may not have been done of design. It is, however, a fact that most of the French guns of the Vallière system which have come down to us, in which the weight of guns was two hundred times the weight of its shot, are decorated with arms, and most of the lighter guns of the Gribeauval system are decorated with ciphers. It is also a fact that the next two guns of this collection are heavy pieces and are decorated with arms. But the master's arms are on the chase, and the royal arms on the body of the piece, in the usual French fashion of the century, instead of in the arrangement shown in the two great howitzers.

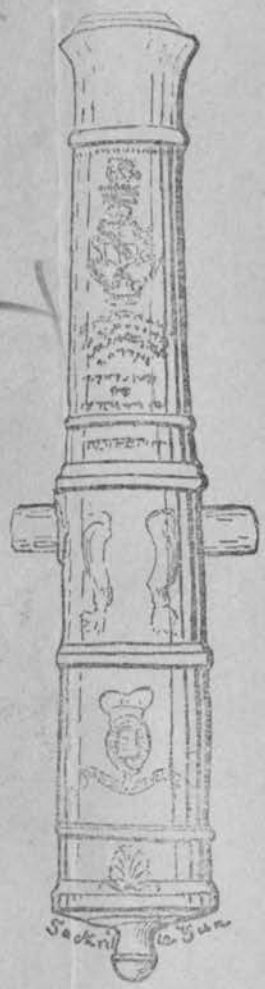
THE SACKVILLE GUN.

Length, 5 feet 11½ inches; calibre, 4.65 inches; weight, 21-2-13 (2421 pounds); No. 26. Classification, heavy twelve pounder.

BOWEN'S ROYAL CIPHER.

On the base-ring we read, "*W. Bowen, fecit* 1759." On the re-enforce are the royal arms within a garter. On the chase are the arms of a commoner, which have two peculiarities. They are shown to be those of a third son, by the small star of five points near the upper centre of the shield.

The crest is an estoile of six points which rises from a crest coronet instead of from a wreath. This crest coronet is not in the usual form derived from the ducal ensign, but is a coronet of France, and resembles the designating crown of the Bourbon princes. Its use as an English heraldic appendage is rare, perhaps unique in the house of Sackville, a family noted in arms, in affairs, in society, and in letters from the time of the Tudors to the reign of Victoria, members of which have figured in all the grades of the peerage, and most of the offices of state, during this period of three hundred and fifty years.



On a raised riband on the chase we read, "The Right Honorable Lord George Sackville, Lieut. Gen., and the rest of the princip^le officers of his Maj'ys Ordnance."

The stern inscriptions of war are indented on the metal of this piece. A heavy cannon shot has ricochetted from over the first quarter of the shield, and almost obliterated the "bend vair." The dedicating inscription has been nearly effaced in places from the same cause. Rough and irregular scars of violent collisions in other places have written the history of a terrible enfilade fire, a dismounted gun and a gun detachment of maimed or slaughtered matrosses.

Macaulay, in his essay on Chatham written in 1844, speaking of a time about a year later than the date of this piece, says, "Indeed, so far as we recollect, there were in the whole House of Commons only two men of distinguished abilities who were not connected with the government, and those two men stood so low in public estimation that the only service which they could have rendered to any government would have been to oppose it. We speak of Lord George Sackville and Bubb Daddington."

Lord George Sackville was the third son of the first, and was father of the second and last Duke of Dorset.

He was born in 1716. He entered the army in 1737, and served with credit at Dettingen under George II., than whom no braver man, and no better judge of a brave man, ever lived. After Fontenoy, that glutton's feast of English valor and tenacity, William of Cumberland, who had an hereditary capacity for discovering a soldier's quality, selected him for service in the Scotch campaign which ended at Culloden.

He was secretary for Ireland in his father's viceroyalty, and quarrelled with Mr. Speaker Boyle with a vigorous and successful pungency, which occu-

pied two years of time, and took from the public a pension of £2000, and from the King, the Earldom of Shannon, before the speaker's peace of mind could be restored. In 1758, he went with the second Duke of Marlborough on the first St. Malo expedition, "breaking windows with guineas," as Fox called it. This demonstration detained in France forces which were needed beyond the Rhine, and enabled Prince Ferdinand of Brunswick to win the battle of Crefeld with troops which had been disgraced a year before. Sackville was offered command of a second coast expedition, planned by the admirable strategy of Pitt, which combined the army and navy, and thus, while adding only a small force to the army, and at the very moment of landing, spread far and wide multiplied fears of a descent, from the mobility of the whole force, and the secrecy of its movements. But Lord George would have none of it. Thackeray sketches him at this period as a "poker of a nobleman." He stiffly told Pitt he was "tired of buccaneering." He was then sent to Germany as Lieutenant-General to Marlborough, and on the death of the duke obtained the command of the English contingent.

LORD GEORGE GERMAINE.
(After Romney.)

Ligonier succeeded Marlborough as Master General of Ordnance, July 3, 1759.

It was probably at this time, though perhaps it was as early as October, 1757, that Lord George became Lieutenant-General of Ordnance. He had been connected with the Ordnance office before 1759 undoubtedly, but as a proxy rather than as a titulary.

Lord George had before this time won reputation as a parliamentary debater. In the latter part of 1759, Horace Walpole, no mean judge of men, and usually just, save when he was embroidering an anonymous slander into a satirical personal anecdote, wrote of him, "Nobody stood higher. Nobody has more ambition or more sense."

He was misplaced in his German command. His character was critical, carping, and censorious. He was an incurable grumbler. It is plain that he thought himself the equal of his general-in-chief in military rank, — for he and Prince Ferdinand held like British commissions, — and the superior

in military skill. He cavilled at the orders sent him, and at the plans and purposes of headquarters, and made it manifest that there was one man in the army who believed that the German princeling should receive and not give directions for the war. This was an English sentiment, and the n[illegible]on itself often thought Hanover a burden, and believed that British lives would be sacrificed and British interests subordinated by a Brunswick prince to secure only a small advantage to the electorate.

MASTER'S ARMS FROM SACKVILLE GUN.

His character, ability, and cast of mind seem to have been reproduced a hundred years later in the Cavalry-General of the Crimean war, Lord Lucan. Naturally such a man, in a crisis, was liable to be swayed by a carping jealousy rather than by subordination and zeal to interpret and execute his general's orders.

The crisis came August 1, 1759, not thirty days after he got the lieutenant-generalcy of the Ordnance. Indeed, it is probable that the workmen at Woolwich had not yet put the last touches of the file, or the last strokes of the chisel, to the inscription with which his associates at the Ordnance office were celebrating his promotion.

During the spring and summer, fortune had favored the French. Prince Ferdinand had lost more than one battle, and town after town had been given up. The French army outnumbered his, and had all the confidence which comes from success. Prince Ferdinand enticed them from their strong position at Minden, detached heavily from his own army to destroy their communications, and received their attack on a field where they were huddled and he was well deployed. This combination promised so well that he wrote on the night of July 31, to a division general, "If so much as a wagon escapes, you shall answer it with your head." In the morning the French army moved in several columns against the allies, and endeavored to force back the infantry, so that their own foot might deploy. Desperate charges of horse were repeatedly repelled, until the French cavalry was utterly disordered and spent. Marshal Coutades then undertook to withdraw. The French columns retired over a constantly narrowing field, and there was an opportunity for a Trebbia. Lord George, with a superb command of English horse and an equally fine German division, had been an inactive spectator. Prince Ferdinand saw the chance. Aid after aid came

riding down. Captain Witzingerode with the order to attack, Colonel Fitzroy, "out of breath with galloping," ordering an advance of the English horse, and saying that there was a glorious opportunity for distinction, Captain Ligonier, nephew of the Marshal, ordering an advance of all the cavalry, and saying that the discrepancy between his orders and Fitzroy's was in numbers only, but the destination was unchanged. Lord George hoped they would not be "in a hurry," and said, "Surely his Highness cannot intend to break the line." He proposed to ride over to see the prince in order to consult about the movement.

LORD CHATHAM.
(From an Etching.)

Unable to get the English horse to move alone, or all the horse to move together, after waiting half an hour, the general-in-chief disregarded the hierarchy, and sent an order direct to Sackville's lieutenant-general, Lord Granby, to charge with the German cavalry. There was no hesitation there. The charging German horse assailed, hurried, pressed, and confused the rear guard of the French. But time was then of the essence of victory. The main body of the French reached deploying ground and opened out in line. What might have been a disaster turned out to be a mere repluse.

Lord George felt that day no shame for his idleness, and went the same evening with the other generals to Prince Ferdinand's reception.

On August 2, Prince Ferdinand wrote some history. The congratulatory battle order spoke to Lord Granby in person, that "if good fortune had put him at the head of the cavalry of the right wing . . . the decision of the day would have been more complete and brilliant." It said no word of Sackville, but it desired and ordered the general officers "punctually and without delay to obey the orders brought by headquarters aides de camp." There was no arrest. No charges were preferred. Prince Ferdinand did not relieve Lord George from duty. He merely requested his recall. Lord George, however, wrote for leave to resign his command and return to England, and was ordered home at his own request.

It is clear from this that there was some doubt at the time how far the authority of Prince Ferdinand could go. In later days Wellington, or any of Napoleon's generals commanding allied troops, could have disciplined an officer for such an offence. But neither French nor English generals in the Crimea could have disciplined or even ordered any officer or man of the army of the other nation, and grave diplomacy arose over St. Arnaud's use of "*engagé*" in regard to Lord Raglan at the Alma.

On leaving the army, which felt he had dawdled it out of a great victory, Sackville went home to find himself the most unpopular man in England.

He could not have a court martial then and there, for all the witnesses were in Germany, till time for winter quarters came. He could not satisfy Pitt, the war minister, that there was any excuse for allowing a repulse to remain a well-ordered retreat, when activity could have made it a ruin. He could not satisfy the nation that a general could earn his pay by not fighting, when it would be advantageous to his country. He could not satisfy the King that his continuance in the army as a general, a colonel, or an ordnance officer, was for the good of the service. Two years before, a royal prince had surrendered his army, and his father had not yet forgiven him. Two years before, an admiral had failed to press the enemy and to succor Minorca. A court martial acquitted him of cowardice, but not of failure in enterprise and energy.

ALEXANDER LAMETH.
(From a Lithograph.)

The marines of the "Monarque" had crimsoned her quarter-deck with the life of Byng.

The dismissal of Lord George Sackville was moderation compared with these precedents. In a single day, he lost his commissions as a general, as a colonel, and in the Ordnance. He had held this last less than three months. The King, with his own hand, erased his name from the council book. He insisted on a trial, and a court was convened the next year. As he was out of service, it was, in effect, a court of inquiry rather than a court martial. The hearing was long, and it exposed all the defects of character, all the infirmities of temper of Lord George, his pride, his arrogance, his love of controversy, his felicity in contention, his contempt for the servile minds who agreed with him, and the drivelling fools who differed from him. It ended by a finding that Lord George Sackville had been guilty of disobedience of orders in the face of the enemy, and was "unfit to serve his majesty in any military capacity whatever."

This calamity did not repress him. On the 11th of May, 1762, in a debate on the subsidy to Portugal, he threw out such insinuations, that Pitt, no longer in office, felt called on to say that no public money had stuck to his hands. In 1766, to the great indignation of Pitt, he was re-sworn of the privy council. In 1771, having meantime inherited a considerable estate on condition that he should change his name to Germaine, he assumed some prominence, and gained some popularity in a contest between the Lords and Commons about privilege, and by fighting a duel for words spoken in debate.

In 1775, American affairs were a matter of serious concern. Lexington,

Concord, and Bunker Hill were proofs that the issue between the mother country and her provinces was concession or conquest. The King and Lord North decided for coercion, and in the fall of the year the cabinet was reconstructed. The court of 1760 had only declared Lord George's unfitness for military service. Lord George got the seals of the colonial office.

PICHEGRU.
(After Belliard.)

He was unfit to serve the King in war, but this civil position, under the policy of the government, gave him the power to direct the operations of the American war. It was for him to nourish, supply, reinforce, arm, recruit, and direct the troops and their generals serving in America.

He favored the employment of Indians on the royal side, because it was "a power which Providence had put in the King's hands, the exercise of which the King should not forego." But he he did not sign or despatch the order to Sir William Howe to co-operate at all events with Burgoyne. He only promised and prepared it. He favored the blood-money treaties with German princelings, which gave to England's King, with which to deprive English subjects of English liberties, his German hordes, kidnapped by the press gang, and unwillingly embodied as soldiers; whose uncouth tongue, in a land of English speech, prevented them from asking for bread except at their own colors. He allowed the semi-royal dealers in human flesh to make shameful profits on the pay of these soldiers, and collect for full musters. But he did not require for his master that the waste of the battalions should be supplied by recruits, or make any allowance to his generals for the necessary diminution of musters by war. He cut out the work of his generals according to the enumeration of the muster-in rolls, not according to the inspection reports. He could never understand that inspection reports and pay-rolls never agree, and that an army fights on its inspection strength, not on its muster for pay. No general-in-chief in America could ever merit his applause, and he never suspected that he was at all to blame. Under his management England lost the brightest jewels of her crown. In 1782, on the surrender of Cornwallis, he entered the House of Lords as Viscount Sackville, and the first resolution he heard offered was

one which set forth that his "promotion to the peerage was derogatory to the honor of the House of Lords."

He died August 26, 1785. His son became Duke of Dorset. His title of Sackville was inherited by children of his daughter, and at last came to the late British minister at Washington.

D'ESTAING.
(After Sandon.)

The family motto of the Sackvilles inscribed beneath the arms is, "*Aut nun quam tentes, aut perfice*" (Either attempt not, or conclude).

An heraldic motto is often assumed to furnish a clue to the springs of action most valued by the bearer, and most desired by him as an inheritance for his descendants.

The Sackville prudence had formerly avoided rash undertakings as well as fickle conduct. Their pride had been tempered by modesty and had not overcome their public spirit.

But Lord George was almost as rash and quite as selfish as he was obstinate. His persistency was as much concerned to reverse a judgment of his military incompetency, which military men had laid before George II., by directing a distant war from a London office, as it was to save the colonies to the crown. Success in war would prove military capacity.

For six years he planned, contrived, and ordered the American war. His ear was deaf to the advice of Gage, of Howe, of Burgoyne, of every returning officer.

His mind was opaque and his heart was cold to every scheme but force. He desired no reconciliation between crown and colonies, but their submission. There should be no promises. American liberties were to yield to England's prerogative. Such a success achieved by him might contradict the judgment of Minden.

For this he worked. We read the result on the gun, scarred by the casualties of war and inscribed with the dates of Minden and of Yorktown.

Minden had cost him his military reputation and his military places. Yorktown cost him his political reputation and civic place. In twenty-two years the disgraced general of Minden had made a new reputation, run a new career, and ended in a civic disaster as great for himself as the military disaster of Minden.

It was worse for his country. The military register of his highest military position at the date of his military disgrace, is the palimpsest which records his civil incapacity and fall.

THE GRANBY GUN.

This gun is similar in size, proportion, calibre, classification, and style to the Sackville gun. But it weighs 21-1-20 (2400 pounds), a variation of less than one per cent, partly accounted for by the ribbon ornament of the other gun. The familiar royal arms are on the re-enforce. It bears the artistic signature on the base ring, "W. Bowen fecit 1767."

It was made under George III. The arms on the chase have in the centre of the chief a label of three points, and, as they are engraved with a marquis' coronet, must have belonged to the eldest son of a duke then living.

The two blue bars on a gold field denote the family of Manners. The quartered "chief" of France and England, exhibiting, however, but two of the lilies and but one of the lions, because it is a "chief," point to a descent from Anne Plantagenet, a princess of York, and is an heraldic index of the fact, assigned by Henry VIII. to the Earl of Rutland.

This, then, is a commemorative medal of the mastership of John, Marquis of Granby, commander-in-chief from 1765 to 1770.

GRANBY ARMS BY BOWEN.

His name has been made familiar to English speaking people throughout the world, by the genius of Dickens. His burly form and frank face was for some forty years the commonest of English tavern signs, and designated to every Englishman in the early part of this century a familiar environment for the martyrdom of the shepherd Stiggins by the elder Weller.

John Manners, Marquess of Granby, was son of the second and father of the third Duke of Rutland. His grandson was an archbishop of Canterbury, his great-grandson a famous speaker of the House of Commons, and another great-grandson is Lord John Manners, a noted conservative statesman. He

was born in 1723; he entered the army in the rebellion of 1745, as colonel of a new regiment.

He became a major-general in 1755, and lieutenant-general in 1759, on the death of the second Duke of Marlborough. His first very prominent service was at Minden, and he was conspicuous from then till the close of the seven years' war. At Warberg, in 1760, a victory was won by Prince Ferdinand through the activity and valor of Granby's horse. In 1761, at Kirch Dunkern, he commanded the left wing and bore the brunt of the successive attacks of two marshals of France, and clearly proved himself a better master of the tactics of combat than De Broglie or Soubise. At Bittenberg, in 1762, he commanded the right wing in the victory won over Prince Xavier of Saxony. He was a competent second in command at Gravestein and Homburg.

MARQUIS OF GRANBY.
(After Reynolds.)

No judgment can be passed upon him as a strategist, for he never commanded in chief in campaign. But wherever cavalry was to be led, or a wing or a corps was assigned a special part in battle, if a tenacious stand or an enterprising, well-sustained, and well-protected attack was required under a clear appreciation of the plan of battle and its relations to the campaign, with a quick apprehension and punctual execution of orders, which should promptly adapt the tactics to the general necessity, and always consider the flux and flow of fight, guarding against peril, and taking advantage of openings, Granby was as loyal, zealous, active, public-spirited, and efficient a comrade to his chief as Eugene was to Marlborough. No adverse criticism was ever heard of superior or subordinate on his courage, his conduct in action, his sympathy with his command, his accord with his commander. No one ever doubted that in time of need he rigidly exacted the last effort of every man, nor that he had a deep consideration for the labors, sufferings, and sorrows of his troops, and was willing to share their utmost perils and hardships. He was approved as just of mind and kind of heart.

Pitt's shrewd policy had recognized that a sentimental preference for the deprived King was compatible with perfect loyalty to the crown of Great Britain, and had added to the British army several regiments of Jacobites, in brave uniforms of Scottish tartan, with belts and plaid and philabegs. When

suitably trained, a Highland brigade was sent to Germany. The companies were each of a single clan when the regiments were not completely clan regiments.

Lord Granby wisely gave them all opportunity to make a reputation, and caused their gallantry to be noticed. At Kirch Dunkern, when the whole stress of the action fell on his wing, Prince Ferdinand, in the battle order, signalized the fact that these soldierly battalions, "in resisting and repulsing the repeated attacks of the chosen troops of France, had deservedly gained the highest honor." By such a page of history as this those simple hearts would fill with loyalty to their regimental flag, fully as reliable in war, as loyalty to the person of the "best of sovereigns."

GRANBY'S PAGE.
(After Reynolds.)

To Granby's able policy much of Pitt's success with the Scotch levies was due. Clan loyalty, a source of danger to the state when unemployed, was made by this means a potent factor of Britain's power, when it became regimental tradition and *esprit du corps*.

The war over, Granby came to England. He had been lieutenant-general of Ordnance since 1759, but all the time abroad.

To put the nation on a peace footing, to take in arms, ammunition, equipments, and material, to inspect them, to select the serviceable to be stored, the unserviceable to be broken up or sold, to set the engineers at works of peace, to reduce the artillery to a proper footing and assign them to stations, required much special work, and peculiar fitness for administration.

Mr. Grenville formed his government early in 1763, and forced the resignation of Ligonier, as master-general, by the gift of an English peerage and a pension. Granby was made master-general, and Viscount Townshend lieutenant-general.

At about this time the practice of casting cannon solid instead of around a core began. It was a Swiss invention, which slowly spread over Europe.

We should have heard something of it if Granby's administration of the Ordnance had not been wise and judicious. But no adverse criticism has come to us about it.

The general administration of the army had, during the reign of George II., been vested in a commander-in-chief or captain-general, who was not in politics, nor a member of the cabinet; and who, subject to the King's

approval, distributed the patronage on purely military grounds. Sir Robert Walpole had complained that he could not get so much as a cornet appointed. A few dismissals had been made by the King's own motion.

Lord Cobham and the Duke of Bolton had lost their regiments for opposing the excise, but Cobham was afterwards restored and promoted. Pitt also lost a cornetcy in the Blues for incendiary speeches in the House of Commons.

GEORGE II. AS CAPT. LACHESIS.

At the accession of George III., however, a deliberate attempt was made to introduce personal government and to make the ministry really the King's servants, and the King, in this attempt to govern as well as reign, prepared to wield the whole power of the state in aid of the parliamentary position of ministers. A first step in this direction was taken under Grenville, by interfering with Ligonier. A second, in 1765, removed him.

The commander-in-chief now became a member of the cabinet, and it was understood that the ministry should, through the King, control the army patronage on political grounds. Granby was a cabinet officer nearly five years. He tried to avert the American war by the repeal of all parliamentary taxes. He had courage to repent on the floor of Parliament his vote for the seating of Luttrell, and to resign all his appointments in 1770 and to go into opposition. It is believed that the long administration of Lord North, which wrought so much harm to England, might have been avoided, or at least overthrown, much sooner, had Granby lived to check, by his great prestige, the King's disastrous meddling.

Granby died in 1770. The Horse Guards were run by the King till 1778, when Lord Amherst came in as general commanding in chief on the staff, and from that time for several years the command of the army continued a political position, the commander-in-chief being nominally a member of the cabinet till the advent of the Duke of York in 1792. From 1775 till after the middle of this century, the army continued the Royal army, with all appointments and peace administration in the hands of the commander-in-chief as agent of the King or Queen, and was borrowed for war by the nation, whose ministry gave it the fighting orders. Between 1855 and 1870, the changes were made by which the Royal army became the nation's army; the Horse Guards became a non-political part of the machinery

TOASTING MUFFINS.

of the war department, and direct and smooth efficiency was established, in place of awkward circuity and fiction.

The date of this gun, therefore, marked the beginning of the last conflict between personal and parliamentary government in England. The Master's arms upon it designate one of the earliest and noblest converts to the modern system of army administration.

IGNAVIA (LORD NORTH).

England was right in her selection of him as a national hero to be painted on street signs, and America, spite of the fact that her independence has made her great, can hold John Manners, Lord Granby, in esteem for striving to avert the Revolutionary War, and be glad that the defacing blows of battle have failed to scar this historic medal which commemorates his great position, and which still clearly displays the family motto, which regulated his life, "*Pour y parvenir*" (To gain results).

The eighteenth century in England was a peculiar epoch. The revolution of 1688 had practically established the fact that the nation of England was ruled by Parliament, and that the executive might be displaced by the combined action of the two branches of the Legislature, who possessed the initiative in law-making. The ultimate sovereignty of the people over Parliament was not acknowledged, nor was Parliament in any true sense a representative body, except of the landed proprietors.

SIR GEOFFREY AMHERST

(After Sayer. Intended as a character sketch, not a caricature.

Trade, commerce, manufactures, the foundation of British greatness, were supposed to have legislative influence by borough representation, but many of the seats of wealth and power were not parliamentary boroughs, while many parliamentary boroughs were decayed; in more, great men exercised undue influence. Where suffrage was open and free the electors were contemptuously called "pot-wallers" or "pot-wallopers." Seats in the House of Commons were often sold. "Head-money" to electors was often paid, and subscriptions to local charities or improvements were common with candidates. Although Parliament was in session three quarters of the year, it was seldom renewed. The advantages of office were great, and many public men were pluralists.

Ministers did not hesitate to purchase support of members by offices, honors, pensions, or by money payments, for votes. The code of morals was so low that Sir Robert Walpole was thought to have disgraced himself more by acts of honesty to one woman in making her his wife, and to another, his daughter, in getting a royal recognition of his relationship, than Bolingbroke or Ormond by their treasons. It was an age that enforced theological con-

formity by penal laws, while it despised domestic virtue, — which preferred a purchased and venal success to a consciousness of right and reason in opposition.

The most profane man in England at one time distributed the Crown patronage in the Church. Some of the hardest drinkers of the day were cabinet ministers. Casanova dared to gain admission to court. Yet with all this there was a marked improvement during the century in morals, manners, and public spirit. It was largely due to the rising of the press.

Literary and artistic England in that century distinguished itself particularly by the production of lampoons, libels, and caricatures. Opprobrious or characteristic names were given to prominent men, indicating particulars of person, of mind, of habits, or of biography. A royal prince was called "the butcher." A First Lord of the Admiralty, "Jemmy Twitcher." The great Earl of Chatham, in the middle of the last century, and his son William, at its close, were known as the "Bottomless Pit." Lord-Chancellor Hardwick was the "great Mufti." The elder Fox was "Volpone," the younger was the "Black Boy" or "Niger." Chancellor Cowper figured as "Will Bigamy." Sir Robert Walpole was called "Blue String." Lord North was "Boreas," "Ignavia," and "Sir Oliver Blubber." Grenville was "The Gentle Shepherd." Pope was "Poet Pug." There were "Champagne Charlie" and "Cocking George," "Cassius," Lord Lyttleton, and the "Jesuit," Burke, also called the "Dinner Bell." Royalty did not escape. George II. was the "Captain," and George III. the "Button Maker" and "Farmer George." The capacity of ministers was often intimated by the title of "Barber's Block." Peter Pindar represented in verse, and Gilray in pencil, that the King was so dull of imagination that he needed to have the mechanical feat of putting apple into a dumpling explained to him. His economy and that of the Queen were held up to ridicule by representing them as personally cooking their own meals.

FARMER GEORGE AND HIS WIFE.

The prince of libellers, "Junius," was anonymous. He never publicly confessed. He has been so numerously and so unaccountably identified, and

so many *alibis* have been proved or other avoidances set up, that, spite of the high probability that has been reached against two or three persons, his veil can hardly be said to be snatched away.*

Junius was an Ishmael, almost as much of a terror to those he favored as to those he assailed. He gained his first prominence at the expense of Lord Granby. He had been writing under a number of pen-names for some time, and had become conspicuous. The first letter, signed "Junius," published early in 1769, savagely attacked the ministry in general terms, and, without particulars, stigmatized Mansfield as a corrupt judge, and Granby as an incompetent and corrupt head of the army. It attracted notice as a piece of sharp criticism, but probably changed no opinions. For the time it was not noticeably severe, although exceptionably well put. Unfortunately for Lord Granby, an attempt was made to correct some misrepresentations, and to demand particulars of misconduct, and this answer admitted that Lord Granby had provided for his relatives and friends, and had occasionally, in social moments, caused greater expectations than were realized. The defense was thought chivalric and satisfactory.

DUKE OF CUMBERLAND.

It gave the satirist a chance. The first scattering and indiscriminate attack was followed by a vicious repetition of the criticism, particularizing one abuse, the appointment of Lord Percy to a regiment. This second letter distorted the defender's language, and stormed against the private life and public acts of the commander-in-chief, and against the shortcomings of his friend, Sir William Draper. The masked writer brutally invaded social decency; he meanly misrepresented facts and drew unwarranted conclusions with a burst of gorgeous diction which veiled his baseness and transfigured his trumpery charges.

CASSIUS.
(Lord Lyttleton.)

In all the writings acknowledged by Junius, but three specific faults are found with Lord Granby. One was where he erred with Sir William Blackstone in a matter of law, the seating of Luttrell in the contest with Wilkes. The second was the displacement of Amherst as Governor of Virginia, which

* NOTE. — There were, in 1772 and 1773, when, as Lord Campbell says, "a little provinder was held out to him and he was sent to whet his tusks in a distant land," three or four conclusive identifications successively in his control, which he probably used in making his negotiation with the court, — the returned manuscript of his letter to Lord Mansfield, of January 21, 1772, and duplicate set of its proofs, both sent him by Woodfall a few days before the letter came out, — the two blue-paper copies of the book without the index, sent about March 4, 1772, probably deposited in the archives of some of the ministers of the day, or with some of the King's friends, or with the King himself; and the white vellum copy, in two volumes, received by Junius early in 1773, which he probably kept himself. None of these things have been found. Lady Francis' copy, which she wrote Lord Campbell about, the marriage gift of Sir Philip, is not said to have been in vellum, nor of the first Woodfall edition.

was the work of the colonial office, not of Horse Guards; the third was the gift of a regiment to Percy instead of to some more needy officer. This was the only fault of the three which had to do with any army administration. Percy's fitness for command was shown at Lexington in 1775. No officer could have done better in that situation.

THE CONCEALED JESUIT. (Burke.)

The libeller's work was done. That English soldier who had added most to England's glory for ten years, had been scorched and scarred with public scorn, as a drunkard, a weakling, and a public fraud, and the reading people of England had enjoyed the scandal without thinking ill of the man. The soldier's heart was broken, and he died in 1770, while the impersonal man has become the classic of libel.

The glare and smoke of hot controversy has been dispelled in six-score years, and we look on that scene through the perspective of history. The wild boar of the forest, always vehement, was wrong in controverted facts as often as he was right. Never generous, he was usually unjust. His aim was contemporary applause, the punishment of enemies and rivals, and the gain of place and power, even more than to prosper public administration. His writings are the laurelled immortality of eighteenth-century diatribe, the flower of that period of heartless selfishness which postponed public interests to place and pension, and which habitually and openly sold votes and influence and appointments. That time is happily past.

FRYING SPRATS.

The character of the writer of "Junius" must have been as detestable, coarse, and cruel as his English was direct and clear.

We look back through more than a century at the first victim of his wrath, of whom we are reminded by this gun, and candidly acknowledge that the merits of the assailed were deeds, the merits of the assailant the selection and management of words.

THE VERBRUGGEN GUN OF 1770.

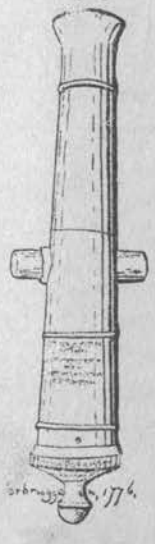
Lord Granby resigned his post as Master of the Ordnance early in 1770, leaving Viscount Townshend at the head of the office as Lieutenant General. In the year 1772, Lord Townshend was promoted to Master General. A very elegant little gun of this collection is marked on the base ring, "*J. & B.*

Verbruggen fecerent 1770." It bears no Royal arms or cipher, no master's arms or cipher. Its dimensions are: length, 3 feet 5½ inches; calibre, 3 inches; weight 1–3–10 (206 pounds); No. 4. Classification, light three or four pounder.

This gun must have been made under the lieutenancy of Townshend, probably, from its low number, just about the time of Granby's resignation. A pair of such guns as this were for some time attached to each British regiment of foot.

LORD MANSFIELD.

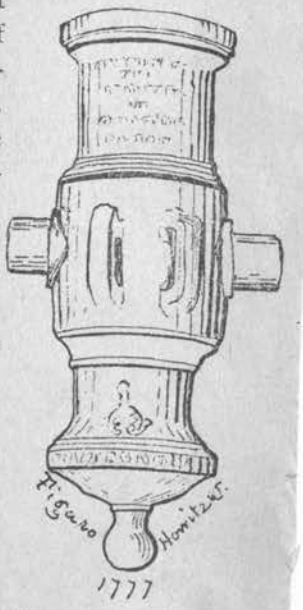
There have been published in the Proceedings of the Royal Artillery Institute a most interesting series of papers on the Woolwich Arsenal by Lieutenant Grover, R.A., who must be by this time, if living, a field officer at the least. It is stated in one of these papers that George III. visited the arsenal in 1772, and there examined a very ingenious boring machine, the invention of Mr. Verbruggen. The article on the boring of ordnance in the third edition of the Encyclopædia Britannica, published between 1787 and 1796 (this particular article about 1791–1793), states that till about twenty years before, that is, till about 1772, iron ordnance had been cast hollow and reamed out, and that the practice of casting it solid began about then, and required a reorganization of the boring machine. For hollow guns the piece had been mounted on a carriage and moved up to the tool, while the tool had been attached to a revolving head, and revolved around its axis in the bore of the gun, which was mounted on a reciprocating carriage.



The new method made the cascable fast to the hub of a waterwheel, mounted the piece in bracket standards boxed to form beds for two or more surfaces of revolution formed on the exterior of the piece, and caused it to revolve around the axis of the bore by water-power. A boring rod arranged in the line of this axis, armed on its end with a "carp's-tongue" drill, and on its sides with three adjustable, equidistant cutters, was fixed to a reciprocating carriage, mounted on ways and fed automatically by a rack-and-pinion movement actuated by a weighted lever. A copy of the encyclopædia cut has been given, and it is probable that this machine is the Verbruggen machine examined by George III.

A FRENCH HOWITZER.

The nine pieces already described are English, and have all been traced to the Woolwich arsenal. There is, however, in the park a French gun, marked on the base ring, "*Berenger à Douay, 7 Juin*, 1777." This inscription names the superintendent of a Royal arsenal of France, and the town where he lived and worked. The piece is 3 feet 9½ inches long, and is numbered 4. Its original calibre was 8 *pouces* (8.5 English inches); weight, 1130 *livres* (1147 pounds); classification, 8-inch French howitzer. It has square handles with chamfered edges, a form of handle introduced late in the reign of Louis XV. or early in that of Louis XVI. by Jean François Berenger, and now known in this country as the square French handle.



The gun, though modelled in a Royal arsenal and inscribed with the name of the master founder, is irregular. It has neither Royal nor official arms or ciphers on it, as was customary with the artillery of the army of France, and required by the regulation of Henry IV. This is not accidental, for a duplicate of this gun, No. 9, by the same maker, is in the Washington navy yard. It is dated, "9 *Octobre*, 1777." It also is destitute of Royal, of national, and of personal emblems, ciphers, or arms.

This is a heavy piece. It was not taken from Gates or Greene, for the pieces they lost were small, and, to some extent at least, were the captures of Saratoga. No losses of the French on the sea, or in the West Indies, combined with known movements of English vessels, could have brought this gun to Yorktown. Bronze artillery is not mentioned among the booty of Savannah. This piece must, then, have come up from Charleston with Cornwallis.

It was cast before the French alliance, in the year of secret sympathy of the French court and nation for America, at the time when the French arsenals and magazines were open to the perquisitions of Beaumarchais, author of the opera of "The Barber of Seville," watchmaker, inventor, poet, litigant, musician, merchant, wit, courtier, diplomat, — a master of every art he practised, the contractor with America for military supplies, the negotiator of the French and Spanish subsidies, and creditor of the United States for more than half a century for these very supplies.

It is hardly hazardous to say that this piece was specially cast at Douay

for the revolted Colonies, was brought over either in the private armed ship of Rodrigues, Henriques & Co., or under the convoy of D'Estaing, and formed part of the armament of Charleston surrendered by Lincoln to Clinton, and was now again surrendered by Cornwallis to Lincoln. Let us therefore recognize Beaumachais as the acting Master of Ordnance for the United States during the war of Independence, and call this piece, in memory of him, the "Figaro" howitzer.

BEAUMARCHAIS.

THE DEVELOPMENT OF ARTILLERY SCIENCE IN EUROPE.

About the middle of the sixteenth century, Hartman announced a common starting point for the constructive artillerist in building and fitting out a train, and for the destructive artillerist in employing it in war, by showing that the calibre of a piece furnished a convenient scale unit, by the use of which, in the first, second, and third powers and their multiples, the dimensions, quantities, and technical values, costs, results, and economies of shapes, proportions, metals, powders, and projectiles could be compared on a common ground.

The true science of artillery begins with the adoption of the calibre scale, and Hartman was its Euclid.

Early in the eighteenth century, Valière, in France, considered all the conditions of the problem by the lights of his day, and recommended few bronze guns and cast-iron shot, a relation between calibre and length of bore of sixteen, and a ratio between weights of gun, shot, and powder of 400 : 2 : 1, as fairly answering the administrative, financial, and combatant needs of the day, and practically attainable by its technical skill.

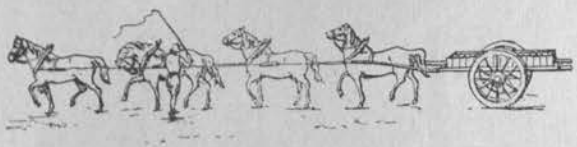
After the middle of the same century, Gribeauval, on further investiga-

FRENCH "BASTARD" LONG SIX-POUNDER, FROM VASSELIEU, 18TH CENTURY.

tion, revised Valière's calculations, and prescribed a length of fifteen calibres, and a weight ratio of 450 : 3 : 1.

A century later, Napoleon III., taking note of a better and more certain metallurgy, of improvements in explosive projectiles and their fuses, in

powder and its employment, and in the mechanical arts wrought by a free and active half-century of industry, and thirty years of European peace, introduced the howitzer cannon for horizontal shell fire. He designed it to use solid shot but seldom. He changed the powder ratio to an exact compromise for his shell of eight pounds weight and twelve pounds calibre between Gribeauval and Valière, taking the solid-shot ratio of 400 : 4 : 1, and the shell ratio of 400 : 2.67 : 1, or 450 : 3 : $1\frac{1}{8}$. The projectile ratio was Gribeauval's. He shortened the gun to eleven calibres, and reduced windage.



18TH CENTURY TUMBRIL, FROM VASSELIEU.

These three complete systems for bronze guns and their charges were the French contributions to artillery science in bronze ordnance in a century and a half. Gribeauval, besides this, reorganized the tackling of the field battery to a form which has become permanent, prescribed an organization of *personnel* which, with some modification, has become universal; improved the carriages to forms which have been superseded by later English forms, and announced the axiom which is the foundation of modern mechanical precision and economy, that similar machines, wherever built, should be made with interchangeable parts.

Gribeauval therefore deserves to be remembered as a prophet of mechanical science, and the pioneer of that system of construction to which all our modern precision and perfection of machinery is due.

GUNS ON THE VALIÈRE SYSTEM.

The two heavy twelves in the park, weighing twenty-four hundred pounds each, and of over fifteen calibres bore, represent the Valière system.

GUNS WHICH REVEAL ENGLISH STUDY.

All the other European guns reveal, by their dimensions on the calibre scale, and by their weight ratios, English ordnance studies on the same problem, and to some degree also a characteristic English habit of subordinating some conditions of their problems, and giving enhanced values to others.

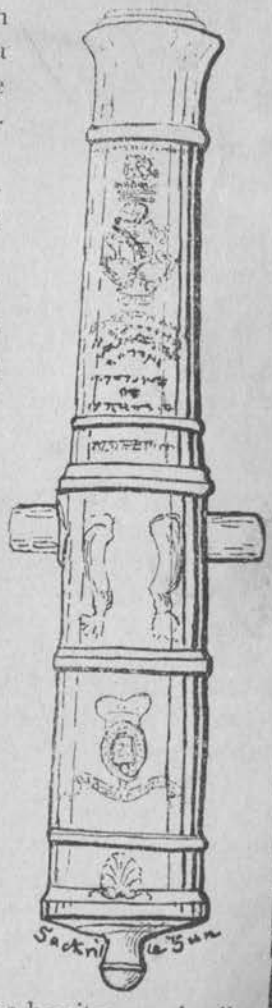
TABLE OF CALIBRE AND WEIGHT RATIO IN THIS PARK.

Name of Piece.	Date of manufacture.	Proximate length of bore. Calibres.	Proximate weight of solid shot. Guns.	Proximate weight of shell. Howitzers.	Ratio of weight of shot or shell to weight of piece (per cent).
Argyle howitzer	1727	4		45	.027
Montague howitzer	1740	4		45	.026
Montague gun	1748	11	24		.019
Ligonier howitzer (Royal)	1755	3.5		17	.033
Ligonier howitzer (Royal)	1760	3.6		17	.038
Ligonier gun	1761	14	6		.011
Verbruggen gun	1770	12	3		.015
Figaro howitzer	1777	3.25		50	.044

The Argyle and Montague howitzers differ in weight about the weight of a projectile. Probably a change of alloy, and the fact that they seem to have been cored castings run horizontally and without compressing sprues, will allow an ample remedy for this.

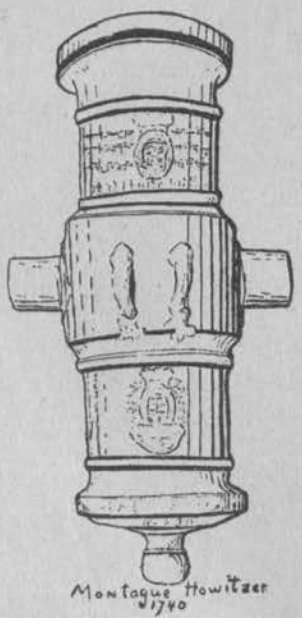
Apparently, in 1748, there was an attempt to proportion the weight of a short gun to its shot at about double the ratio of a howitzer to its shell.

This weight ratio of shot was somewhat lowered in 1761 for a long gun of smaller calibre; but in the gun of medium length and still smaller calibre, made in 1770, the weight ratio of the shot was raised. All these guns, however, are exceptionally light for bronze pieces, and would have been greatly strained in service unless large windage had been allowed.



The Royals were designed as high-calibred shell and canister guns of short range and high mobility. They were associated with infantry columns, and with six- and three-pounder guns. They are on the scale of weights of projectile a third lighter proportionally than the eight-inch howitzers, and are proportionally about an eighth shorter on the calibre scale. The howitzer projectile

weight ratio of the Royals, compared with the gun projectile weight ratio of 1761, is 2 : 7, instead of the 2 : 4 ratio which existed between similar terms in 1740 and 1748.



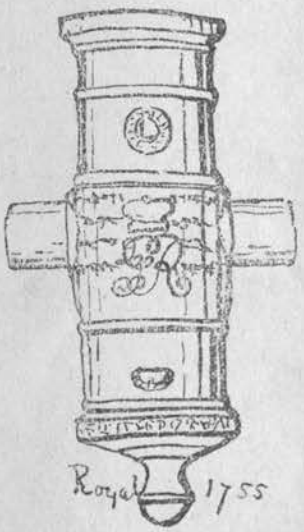
There is a marked change of model in the Royals from 1755 to 1760.

It is impossible that these variations should have been capricious or without intelligent purpose.

COMPARISON OF ENGLISH AND FRENCH METHODS.

The French artillerist aimed at universal excellence in administration, in endurance, in economy. He considered his gun, his projectile, his powder, his appropriation, and sought to so disburse his money among his requirements that each item should receive its due and economic share.

The English artillerists ignored the financial part of the problem altogether, and organized their administration primarily as a factory and warehouse of warlike tools and machinery, with a body of workmen attached, trained to their use, and lent out on occasion with them. They left each general-in-chief free to concert with his chief of artillery and with the ordnance officer his own system of field administration, as the needs of war might dictate. They scorned the ideal, and considered only combatant generalities, the maximum weight of projectile, the greatest range and accuracy, and the highest consistent mobility. The British specialties are high calibres and low weights. In Egypt, in Spain, at Waterloo, we find English nine-pounders opposed to batteries of threes, of fours, of sixes, and of eights. The high-calibre carronade was a special gun of their navy. Lord Raglan's two long eighteens were a notable factor in the Inkerman repulse.



EARLY EUROPEAN ARTILLERY.

A very early professional artillerist in France was Bartemy Seigneur de Pins, captain of the artillery bands of Charles VIII. in 1790. His present representative is Count R. de Pins, who politely procured from the Berlin Artillery Museum a drawing of an old Lorraine bombard used in

defence of Metz in the fifteenth century, and forwarded with it two manuscript notes by different hands.

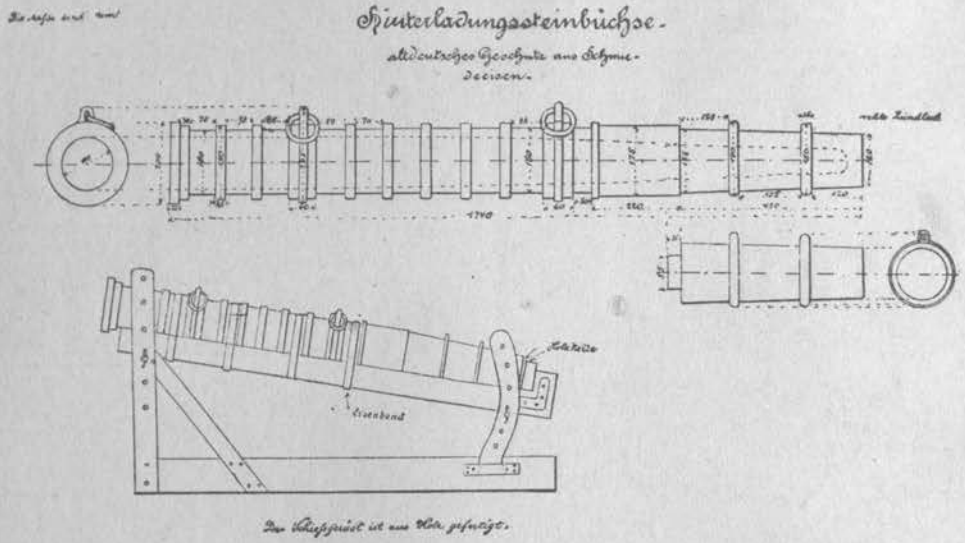
This old gun is of wrought iron. It is about five feet eight and a half inches long and a little over five inches in bore. It is in two parts, the barrel and the chamber. The barrel is welded up of staves of wrought iron, strongly banded with iron hoops, two of which carry rings into which a tackle could be hooked to work the piece conveniently by aid of a derrick. This barrel is about four feet three inches long, and is contracted at the rear to form a seat for the shot and sabot or wad. Probably there was about nine calibres, or three feet ten inches, length of bore from the equator of the shot to the face of the muzzle. The chamber was of plate iron lap-welded over a mandrel. Two bands surround it, which have eyes in a line with each other, possibly for separate rings; but they more likely served as sockets for the ends of a bail or single loop, like the handle of a shawl-strap. The powder cavity of the chamber is a conic frustum about sixteen inches long, and of nearly three inches average diameter. The rear of the barrel is counterbored for about an inch and a half to receive an offset neck on the end of the chamber. A conical vent about three quarters of an inch in largest diameter enters the chamber on the left of its median line near the bottom. The barrel was strapped to a wooden stock which extended far enough to the rear to support the chamber, and was then turned up about two inches in rear of the chamber into a short hurter, between which and the rear face of the chamber a wedging key was driven when the chamber was in place.

COUNT MATHIEU DUMAS.

This gun probably fired a ten-pound stone shot, with about the same weight of powder. It was loaded with its projectile from the muzzle, and with its powder charge at the breach.

This bombard was mounted between two pairs of standards, each pair

furnished with a movable crossbar, so that it might be fired at various elevations and levels. It is a fair specimen of the early European gunpowder artillery, and is between four hundred and five hundred years old.



The following are early European dates, considered authentic, of the use of fire weapons in war. Those before the thirteenth century may refer to Greek fire. The Spanish and Algerian instances relate pretty certainly to gunpowder weapons, and the Damietta event could not have been described as it was, unless rockets were employed, and hardly unless cannon were used:

A.D. 1073, siege of Belgrade, by Solomon of Hungary.
A.D. 1085, sea-fight off Toledo between Spanish and Tunisian ships.
A.D. 1093, sea-fight between Greeks and Pisans.
A.D. 1118, at Saragossa.
A.D. 1156, at Mohadia in Algiers.
A.D. 1157, at Niebla.
A.D. 1238, at Valentia.

16TH CENTURY TRAVELLING PAGE. VASSELIEU.

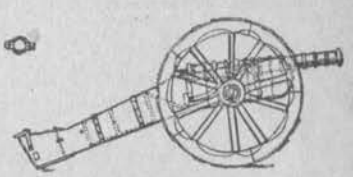
A.D. 1247, at Seville.
A.D. 1249, at Damietta in Egypt.*
A.D. 1280, at Cordova.
A.D. 1308, at Gibraltar.

* In a wood-cut of the landing of St. Louis, printed three centuries later than the crusade in the Grand Voyage de Hiérusalem, but probably derived from an earlier illumination, the Christian army is accompanied by three trunnionless bombards on two-wheeled trucks.

A.D. 1312, at Beza.

All of these instances were sea-fights or sieges, and in most instances Arabs were one of the contending parties.

The chronicles of Metz state the possession by that city of sundry guns, and their use in battle in 1324. But the record is not by a contemporaneous hand, but is either founded on a tradition or is a restatement of the contents of an earlier lost record in the nomenclature of the fifteenth century.



SERPENTINE OF CHARLES THE BOLD, 1470.
(Trunnion band in separate figure at left.)

There still exists a contemporaneous engrossment of a city ordinance of Florence in 1326, appointing inspectors of cannon and ammunition.

An account of 1338 states a payment for powder at the siege of Puy Guillaume in Perigord. Le Sire de Cardaillac made in 1339 ten cannon for the defence of Cambrai. Ouesnoy was defended with cannon in 1340. It is possible — indeed, it is positively asserted by Villani — that the English used cannon at Crécy in 1346. But Froissart does not mention it.

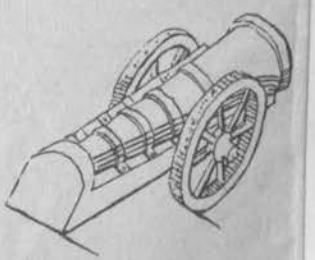
MARQUIS DE ST. SIMON, MAR. DE CAMP.
(After Trumbull.)

Jean Chamdouvrier in 1375 cast twenty-four bronze cannon for the city of Caen. An inspection report of the deficiencies of the bombards of Sceccia in 1397 is preserved at Bologna.

In England, it is claimed that artillery was employed by Henry III. in 1267. Her ordnance establishment can be well traced as far as Edward III. in 1344. A writer of 1375 mentions the use of cannon against the Scots in 1327, and a fairly well authenticated list of stores in the Tower places cannon and gunpowder among them in 1338. Bills for gunpowder and its ingredients are comparatively common after 1345.

Another Lorraine bombard of identical type, and probably of the same period, but without a history, is in the arsenal at Luxembourg.

We may take this as the typical European cannon of the early part of the fifteenth century.



A FIELD BOMBARD LIKE THOSE OF ST. LOUIS OF DAMIETTA.

AUTHENTIC ANCIENT FIREARMS.

The ancient guns which have come to us with authentic dates of manufacture are the Amberg (Bavaria) bombard of 1318; the small wooden-cased Venetian guns of 1379; the wrought-iron guns of the Tower of London, prob-

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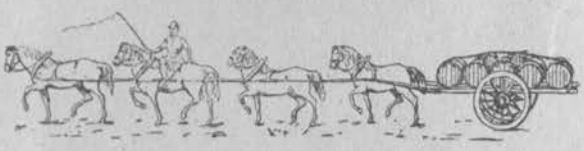
ably of the fourteenth century; the English-made wrought-iron bombards at St. Michel in France, traced to 1433, "Michelette la Grande," of nineteen inches calibre, and "Michelette la Petite," of fifteen inches calibre; the Dritte Geriete of Ghent, of thirty-two inches calibre, dating from 1430; Mons Meg of Edinburgh, traced to 1460, and twenty inches in calibre. These are all wrought-iron, stave and hoop guns, welded, and have detachable chambers, but were muzzle-loaders. The bronze guns hitherto supposed to be of greatest age are the twenty-five inch gun of Mahomet II., at Constantinople, made in 1464, which is in two parts, screwed together; the Russian Tsar Pooschka, of thirty-six inch calibre, a single bronze casting dating from 1546, and the Malik-i-Mydan, at Benares, made in the sixteenth century, and of twenty-eight and a half inch calibre.



16TH CENTURY POWDER CART. VASSELIEU.

These were all bombards, adapted for firing with high trajectories, and had no trunnions.

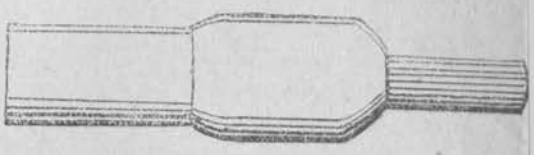
The guns of the "Mary Rose," sunk off Portsmouth in 1545, during the reign of Henry VIII., were recovered within the last fifty years, and are now at Woolwich. They were stocked bronze guns without trunnions, and were cast in 1542 by Francisco de Arcani of Cesena.

AXEL DE FERSEN.

Bureau, who left the service of Burgundy for that of France early in the fifteenth century, has been thought by some to have invented trunnions; but there are six Burgundian guns and several field mortars captured by the Swiss at Granson and Morat in 1476, and at Nancy on New Year's day, 1477, still in existence, in the museum of Neustadt in Switzerland. Three of the guns and all of the mortars are mounted in stocks, which were hinged to the carriage entirely below the body of the piece. Two of the others are banded wrought-iron guns, the bands of which are mortised into the cheeks of the carriage so as to allow of very little vertical movement. One of these has a central clasp with arms which fit in sockets in the cheeks of the carriage, but most of the

recoil was transmitted by the bands. There is, however, one cast-iron gu which is much of the modern shape, and has what may fairly be calle trunnions, but the relation of the gun through the trunnions to the carriage i such that it has very slight vertical mobility.

Volturio's treatise of 1472 does not mention trunnions.

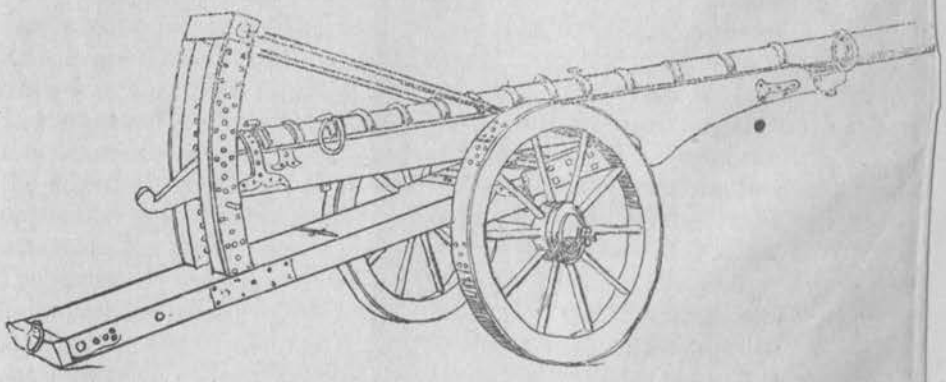


MICHELETTE LA GRANDE.

The Spanish breech-loading draconcillo at Madrid, made at Liege in 1503, has trunnions abreast of the bore, and is carried high above the carriage in a swivelling yoke.

The Cortes guns, one at Annapolis and one at the Washington navy yard, are comparatively shorter and lighter than the draconcillo, but are of like design in emplacement of trunnions, in system of mounting, and in breech mechanism. They were evidently designed for stone balls instead of the iron or lead shot of the end of the fifteenth century.*

Finish and workmanship are doubtful criteria for fixing dates, but peculiarities of metallurgy may betray the school of the founder, and the iron handspike cascable of the Cortes guns, in fused union with the bronze of the breech, shows a technique of a peculiarly Arabic, or at least Semitic, character which can be traced back through thousands of leagues of migration, and through centuries of time, till we find, on the banks of the Tigris, artisans employing this combination in the cauldron tripods of the Assyrian kitchen, and artists in the throne of the Assyrian king.



SERPENTINE OF CHARLES LE TEMERAIRE (1476).

What metallurgist of Europe, save a Spaniard, in those days, could have

* By the manuscript accounts of Charles VIII., it appears that Robin Carbonnel of Heslin made two "moulds" to make "plombées" (lead shot) for the service of the coulevrines of Brittany.

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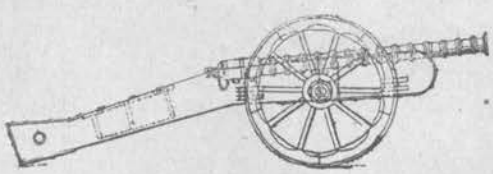
absorbed so much of Arabic methods as to practise this rare technique in such a peculiar place, and what Spanish metallurgist would not have recognized the occasion as most opportune?

The metallurgy and heraldry of the Cortes guns, being Spanish, dates them.

16TH CENTURY BATTERY CART. VASSELIEU.

By the marriage treaty of 1469 between Ferdinand and Isabella, it was stipulated that the arms of Aragon should thereafter be constantly associated with those of Castile and Leon. These Cortes guns are each marked over the trunnion band with a coarsely modelled oval cartouche, divided into four panels by a narrow cross. Two of the panels, the first and fourth, are embossed in low-relief with a chess-rook, and the other two with a lean and hungry rampant lion. There is no association of the vertical stripes of Aragon to show the marriage of Ferdinand, nor of any Austrian fesse or imperial eagle, or Hapsburg, or Flanders, or Holland lions, or Burgundian fleur-de-lis, or collar of the Golden Fleece, to indicate the pretensions of Philip of Burgundy, in right of his wife, between 1504 and 1506, or the claims and lineage of Charles from 1506 to 1513. There is no pomegranate of Granada in base to date them later than 1491. No words could more plainly declare these Cortes guns to have been cast before 1474 — when Isabella inherited — by founders trained in the traditional technology of Moor and Arab, of Phœnician, Assyrian, and Hittite, than the guns themselves, when we have learned to read their language, and to understand that disclosure reveals the truth by its limitations and boundaries as much as by its extent, and that an asserted nationality of Castile and Leon only, is a denial that the marriage treaty which consolidated the Spanish Kingdom was yet an active political force.



BURGUNDIAN SERPENTINE (1496).

The bands are mortised into the cheeks, and the oscillation around the central transverse arms is almost nothing.

MORTAR OF CHARLES LE TEMERAIRE.

This American testimony as to the employment of trunnions, and high mobility about a horizontal axis, carries back this construction to a date sixteen years earlier than any European gun now extant.

Up to the end of the first quarter of the fifteenth century, European ordnance consisted mainly of bombards. For two hundred and fifty years

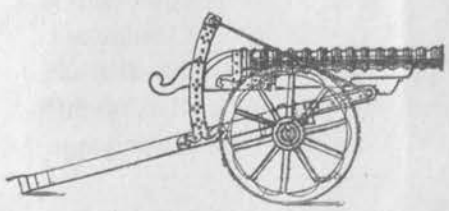
thereafter a vast number of special names appear, each, probably, denoting a type or size of piece.

Between 1467 and 1473, Simon Andrien of Lille, and Bon Valet of Dijon, furnished to Burgundy bombards, serpentines, and couleuvrines. The serpentines had copper chambers. The couleuvrines of another maker, Bouchard of Tours, in 1438, weighed from about twelve pounds to somewhat over twenty-one pounds. Later, in 1513, Chevalier of Douai furnished the city of Lille with serpentines which weighed from one thousand to sixteen hundred pounds. Nine "grosses couleuvrines," made by Bouchard in 1435, were "*garnies chacune d'une moufle et d'une grosse arbalète de fer*" (equipped with a pulley and a great iron crane).

LOUIS XIV.

This clearly implies that these guns were handled like the bombards, and were probably mounted, like them, on wooden horses. In 1452, Pierre Charpentier received thirty-one *livres tournois* for setting up the horses (*chevalets*) of twenty-four large copper couleuvrines during the siege of Rouen. The gun's name of "harquebuse" appears in Andrien's account of 1467. Chevalier made six long "hacquebustes" in 1513, which weighed over sixty pounds each. These were stocked guns fired from a rest, and got their names from the hook or fork with which they were furnished.

The name "cannon" arose very early from the resemblance of the long banded iron tubes to a cane or reed with its projecting joints. The long slim guns received serpent names, "serpentines," "dragons" or "drakes," "dragonneaux" or "draconcillos," "basilisks," and "couleuvrines" (little vipers). The mobile guns of field artillery received the bird names of "falcon" and "falconet," "merlin" or "smeriglio," and "robinet." Probably also the English name "culverin" (little dove) has this relation. The loophole (*spiraglio*) named the "spirole." One may read in Alberghetti's account with Florence in 1467 the name of "passavolanti" (gadabouts), and determine such guns to be field pieces. We shall not be far wrong if we assume the etymology of "veuglaire" to be connected with the Spanish "volcar" (to throw through the air, to overset). It was a sort of mortar.



STOCKED FALCONET OF BURGUNDY AT NEUSTADT.
(After Favé.)

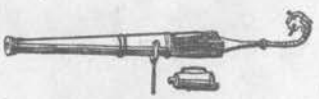
The common stone projectiles gave a name to their gun, the "*perrier*" or "pedrero," which was usually swivel-mounted, and from this coincidence these names, derived from the material of the projectile, became the names for the mechanical structure of the gun-mount. The English called this sort of gun a "peterero."

CHARLES LE TEMERAIRE.
(After Snyderoos.)

Small pieces, two or three-pounders or less, were called "sakers" (*sacre*, a blessing), "minion" (the pet), "madrero" (the fondling). This last name the English transliterated so as to save the sound and reverse the sense, and made characteristic in the Elizabethan name for a langrage swivel, "murderer."

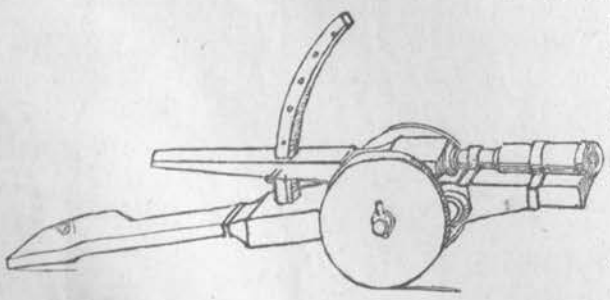
The "ribaudequin" has been given a possible petticoat pedigree, yet it is likely that the grimmer analogy of incarnate wickedness may have made the female camp-follower an appropriate metaphor for a many-shooting breech-loading gun. By analogy, in the array of tubes, this weapon was also called "*orgue*" (organ).

ARTILLERY OF CHARLES OF BURGUNDY AND OF CHARLES VIII. OF FRANCE.



DANTZIC GUN, 16TH CENTURY.
(After Favé.)

The most modern in appearance of the guns of Charles le Téméraire is undoubtedly the one of cast iron. The model of its carriage, too, needs but little of being as serviceable and efficient as any which Napoleon I. ever used. It has the narrow trail with parallel cheeks reintroduced by Gribeauval. It has the trail chest. It has a fairly designed system of straps and hooks. If the forward and middle transoms were lowered a little there would be enough vertical play. The metallic axle and boxed wheels of Gribeauval were great improvements. The Burgundian guns had no limbers.

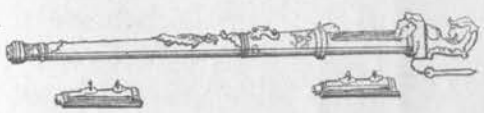


ITALIAN GUN, 16TH CENTURY.

These guns were probably dragged muzzle forward.

The first really formidable field artillery in Europe was the train of bronze guns carried to Italy in 1494 by Charles VIII. They were trunnioned guns, mounted in

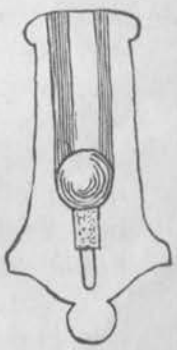
flasks or brackets. Contemporary authors speak of them with high respect. Only one perfect specimen of this train has come down to us, and that without a carriage. It is in the Artillery Museum of Paris. Charles VIII. gave it to Bartemy, Lord de Pins, in 1490; and well along in the present century, Odo, Marquis de Pins-Montbrun, gave it to the French nation, the oldest bronze gun with trunnions in Europe (p. 77).



GERMAN BREECH-LOADER, 16TH CENTURY.
(From Favé.)

The kindness of the French War Department and of the artillery officers in charge of the Museum of Artillery have contributed a drawing of this piece and a rubbing of the inscription. From this, two process illustrations have been made, one on a scale of a half, which shows in black the file marks of four hundred years ago, the other on a quarter scale with the legend in black. They reveal in the one the very limited and imperfect kit of the workman, and in the other his spirited mastery of the art of design, probably the more spirited because he could not read, and treated the inscription as mere ornament (pp. 78, 79).

The piece weighs twenty-four kilos (about fifty-three pounds). It is nearly five feet long over all. It is of little more than an inch calibre, threw a one-inch shot of iron or of lead, and its length of bore is over thirty-seven calibres, an extreme ratio even for a musket. If the shot was iron, it weighed about $2\frac{1}{5}$ ounces, or $\frac{1}{385}$ the weight of the piece. If it was lead, it weighed nearly $3\frac{1}{2}$ ounces, or something less than $\frac{1}{250}$ of the weight of the piece.



VEUGLAIRE.
(After an Inventory.)

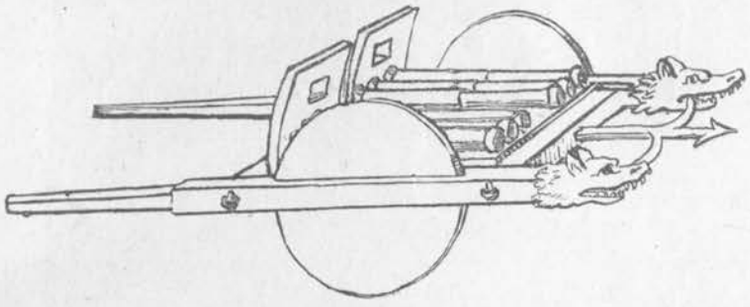
The trunnions of this gun are below the axis of the bore, not abreast of it as in the Cortes guns. It has a powder pan, which was then a novelty, and a rectangular projection below the breech, which may be merely a reminiscence of the flange of a Burgundian breech band of riveted wrought iron, but which would serve so admirably as a quoin-pawl to fit in a series of notches in an elevating wedge and keep it from loss or displacement, that it is hard to believe that it was not intelligently designed for that use.

The representatives of the old artillery chief retained the mate of this gun, at their chief chateau at Aubaignères, Department of Gers, in the south of France, but the use of it, in accordance with a family tradition, which prescribed the firing of a salute at the birth of a son, was unfortunate. When Count Robert was born, the amateur artillerist who observed the tradition of the house employed too large a charge or too smart a powder, and in conse-

SWIVEL, 16TH CENTURY.
(After Favé.)

quence reduced the length of the piece to the first reinforce, on which are preserved the inscription and the family arms.*

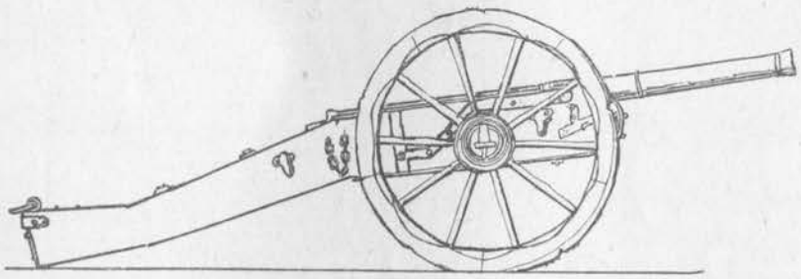
The inscription, to persons not familiar with the obsolete identity of I and



RIBAUDEQUIN, 16TH CENTURY.
(After Napoleon III.)

J, the obsolete confusion of N with U, the ancient but not wholly obsolete fanciful variations in the formation of the letters E and R, and with the obsolete word "instar" so common in Christine de Pisan, has hitherto presented some difficulty. With these in mind the difficulty vanishes.

Donné par Charles VIII. à (given by Charles VIII. to) *Bartemy, Seigneur de Pins* (Bartholomew, Lord de Pins) *instar est request* (according as it is



CAST-IRON GUN OF CHARLES LE TEMERAIRE.

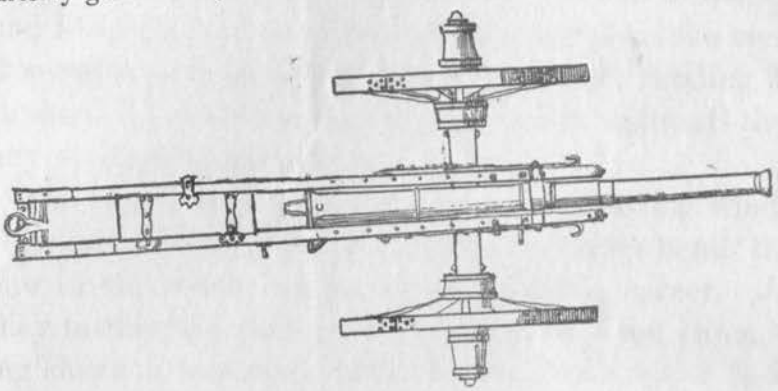
requested), *Capitaine des Bandes* (captain of the troops) *de l'Arthillierie en* 1490 (of artillery in 1490) (pp. 78, 79).

Two other very old French guns are in the Paris Museum, brought from

* The family of "de Pins" has had a persistent prominence in three European nations for about eight centuries. It has had branches in Gascony and Languedoc, in Catalonia, and at Waldberg and Thurn. Its scions have often been conspicuous in church and state, in war and peace. The stock has produced princes, marquises, counts, and barons. They have been called de Pins and de Pinos, de Montbrun, de Biran, de Horgues, Thurn, and Waldberg. The golden pine cones of their arms are blazoned at times on a red, at times on a blue field. A persistent habit of giving to the world, in every generation, some man whom the world needed, has justified their *cri de guerre*, "AU PLUS HAULT LES PINS" (At the top are the Pins).

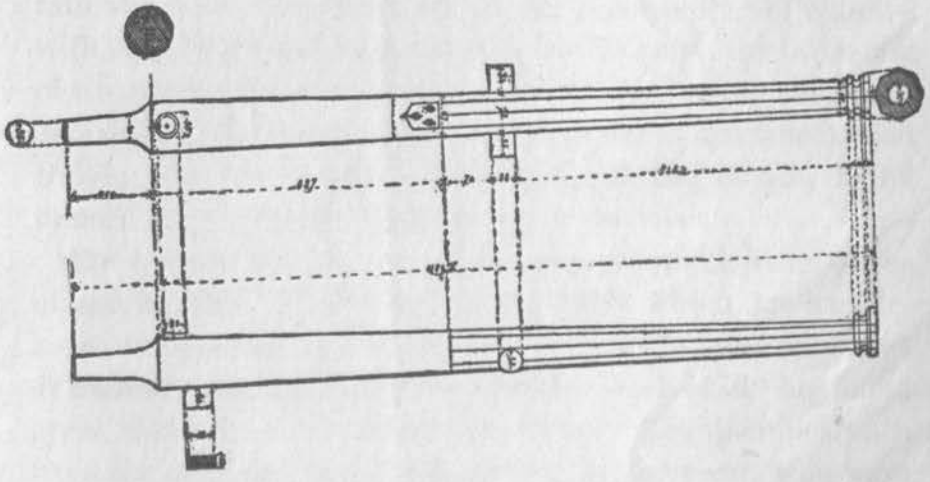
This, also, with another significance (Prosperity to the Pins), we say in acknowledgment of the gracious and voluntary kindness of Count R. de Pins in obtaining and forwarding the drawing of the Lorraine bombard, and the manuscript notes upon it, from Berlin.

Algiers in 1830. But the porcupine badge of Louis XII. and the salamander badge of Francis I., embossed upon them, date them as later than this Bartemy gun. They also have trunnions below the axis of the bore, as



PLAN OF CAST-IRON GUN OF CHARLES LE TEMERAIRE.

do most French and English guns made before 1850. Some German pieces illustrated in catalogues at the time of Charles V., some early Dutch guns, some pieces for firing shell horizontally, called, after their Dutch inventors, Hauwitz and Cohorn, have trunnions abreast of the bore, but the Spanish practice of the fifteenth century, shown in the Cortes guns, had European followers only in the Low Countries and Germany, places under Spanish



FALCONET OF 1490.

Now in Museum of Artillery. From a drawing furnished by the French Ministry of War.

influence, and in peculiar pieces derived from the Low Countries, till recently.

The use of trunnions appears earliest in Spain. The early Spanish loca-

tion of trunnions is the best location. The Burgundian location of the horizontal hinge was a bad location, but the best attainable without trunnions. It follows almost of necessity that the piece of the French artillery was developed from a Burgundian and not from a Spanish model. The French name for "gun carriage" surely comes from a French-speaking people who used stocked guns. "Affût" is by etymology "*ad fust*," the stock-brace or attachment.

HALF SCALE RELIEF PLATE.
(From a French pencil rubbing. Inscription on Bartemy gun.)

Most other tongues have a word which emphasizes the wheeled character of the apparatus. The English say "gun carriage," the Italians, "*carreta*," the Spaniards, "*cureña*" or "*curucña*," in which one can trace the Latin "*currus*" pretty clearly. The Germans show clearly where they got the machine by the word "*Laffete*." The French name betrays the history of the structure, and discloses that the reason why the earlier French pieces had trunnions lower than the bore was the consolidation of gun and stock in the casting.

The French gun and carriage came from Burgundy.

It has taken three hundred and fifty years for European artillery to retract its departure from the Spanish practice of 1474 in the emplacement of trunnions.

ARMS OF PINS.
(From gun in Paris Museum.)

In order to hitch horses to the carriage, the trail was widened to a horse's width for shafts. Although Charles V. had invented the limber as early as the battle of Remy in 1554, it took a century for the French to adopt it, and nearly two centuries for them to return to the narrow trail of the Burgundians. The English reinvented, as late as the last quarter of the eighteenth century, the block trail of the Italian field bombards of the sixteenth century, which became universal. The breast team was illustrated by Colledo in the time of Charles V., and used by Maurice of Nassau in the last part of the sixteenth century. It was illustrated by Fronzperger, and by Leuften-

berg, Feldzeugmeister of Dantzic, in the sixteenth century. Yet it was a hundred years before it prevailed in France, and a hundred and fifty years before it was definitely adopted in England, although Henry VIII. had used it on the continent when he set out from Calais to Boulogne. The use of breast teams for artillery became general only in the present century.

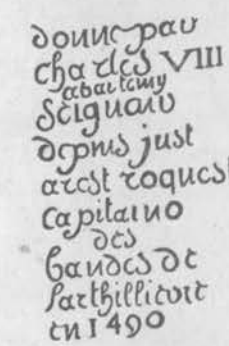
Artillery science is conservative. For such a useful improvement to make its way, required the interval from Maurice of Nassau to Arthur of Waterloo; from Gustavus Adolphus to Napoleon Bonaparte; and yet artillerists learn the lessons of experience better than other military men.

In Cromwell's time, contemporary memoirs tell us that the trooper often tied his sabre to his saddle and thrust his pistols in his boot. Every great war since has found the cavalryman with his firearm on his person and his sabre generally hitched to his horse. Yet the introduction of the revolver in the United States army about the time of the Mexican war, gave the first official recognition to this practice, and it is only since the publication of our latest artillery tactics that the warlike artilleryman has been authorized to tie the sabres of the battery in fagots and strap them to the carriages.

Europeans, in their vanity, have thought, and said, and sung, —

"Better fifty years of Europe
Than a cycle of Cathay."

A fair and impartial knowledge of the modulus of progress in Europe from the introduction of gunpowder to the middle of the present century — a period which includes substantially the early wrought-iron, the early cast-iron, the whole of the bronze periods and much of the later wrought-iron and cast-iron periods — was necessary to enable us to fairly consider the last and most curious specimen of this Trophy Park, and give it its place in the history of the art, a place at once archaic and unique.

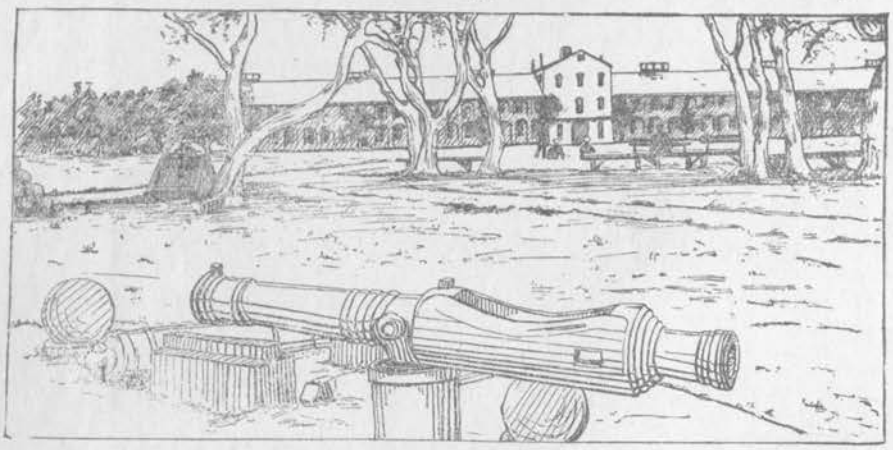


QUARTER SCALE PROCESS CUT FROM AN INKED AND BLEACHED SALT-PRINT OF THE INSCRIPTION.

THE CHINESE SWIVEL.

In the circle of guns upon the grass there stands a post, on top of which is mounted, in an iron swivelling yoke, the body and barrel of a bronze breech-loader, mechanically similar to the two Cortes guns of 1474 at Annapolis and Washington, and to the guns illustrated by Leuftenberg of Dantzic, in the sixteenth century, but of slightly different detail.

It is of solid construction, 40.56 inches long over all. The barrel is 19.62 inches long, and its calibre is 1.44 inches. The breech cavity is a



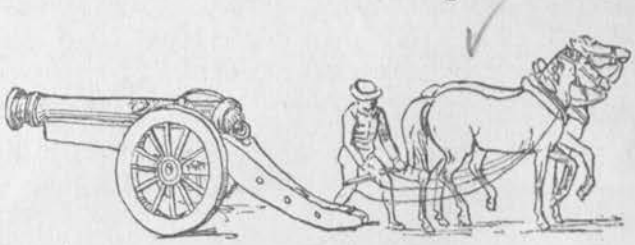
CHINESE SWIVEL.
(From an artillery school photograph.)

prism-shaped box, tapering slightly from rear to front, with deep scollops in

CHRISTIAN DE PIZAN DICTATING HER HISTORY.
(From an old print.)

the upper part of the sides. This cavity is about 11 inches long, $3\frac{3}{4}$ inches wide, and $4\frac{1}{2}$ inches deep at the rear, and about 3 inches wide and $4\frac{1}{2}$ inches

deep at the front. The cascable is hollow. The barrel is ornamented with several ring mouldings. The exterior of the breech boxing is chamfered to a semi-octagon. A transverse keyway, the front of which is about 2 inches forward of the face of the breech, crosses the walls of the breech box. A prismoid to fit the breech box in front of the keyway might be about 3 inches by 4 inches in front, 3.65 inches by 4.25 inches in rear, and 9 inches long, and contain 123 cubic inches. Proper chamfers along the centres of the arrises, and a bore about $7\frac{1}{4}$ inches deep and a calibre in diameter, would reduce the metal of this block to less than 100 cubic inches, which, if of bronze at 7.8 specific gravity, would weigh a little over 28 pounds. Without the breech block, and with the iron swivel, estimated at 6 pounds, the gun now weighs 122 pounds. The bronze body of the gun, therefore, weighs about 116 pounds. Its official weight was $133\frac{1}{3}$ pounds. Its breech block could not have filled the cavity, and could not have been of as heavy a metal as bronze. Other guns of Chinese make at Annapolis have iron breech blocks shaped like the frustum of a cone, and containing about 70 cubic inches of metal, and they weigh about 18 pounds. We have here a breech loader designed for a cast-iron reloading cartridge.

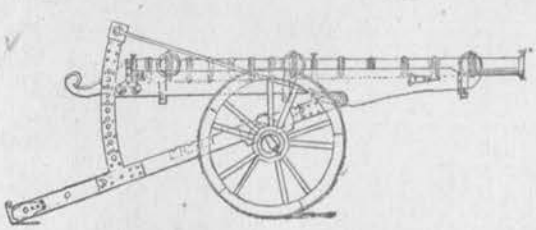


TACKLE, 18TH CENTURY.
(After Colledo. From Favé.)

This gun was captured in Corea in 1871 by Admiral Rodgers. Three others of the same general design, and more complete than this, are at Annapolis.

Major W. F. Randolph, 5th Artillery, presented this piece to the Artillery School.

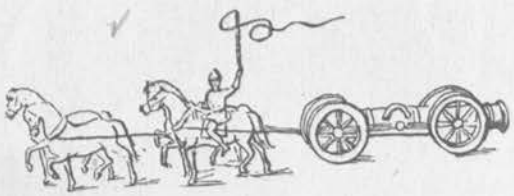
One Chinese method of dating events involves the employment of sixty-year cycles, which are distinguished from each other by the association of regnal names. The years of each cycle are each doubly named, once from a set of ten words repeated six times in invariable order in the cycle, and once from a set of twelve words repeated five times in invariable order. Thus the year-names for the first decade have the ten words of the series of ten, and the first ten words of the series of twelve. For subsequent decades the series of ten recurs in each, but the associated



BURGUNDIAN PIECE, 1476-77.

Boundy July 11, 1894

words of the series of twelve are, in the second decade, the last two and first eight; in the third, the last four and first six; in the fourth, the last six and first four; in the fifth, the last eight and first two; and in the sixth, the last ten.



LEUFTENBERG'S TACKLE, 16TH CENTURY.
(After Favé.)

This method is as simple and accurate to an historical scholar as our method of centuries of the Christian era. It has the same defect when the Imperial name is omitted that the method of dating by centuries has when the figures of the century are omitted. The partly dated text must be fully dated, by the character of the letters, as we should reason on an English text from the use of chancery hand or **Black Letter;** by the prevalence of official titles, as we might date an English text by its employment of the titles Lord General, Secretary of War, Secretary at War, Lords Justices; or a French one from the use of the words Maître du Champ, General of Division, Directory; or an American if we found Corps of Artillerists, Lieutenant General, Regiment of Light Artillery, Commissioner of Agriculture, or the like.

The inscription on this Fort Monroe swivel was submitted by General Tidball, through the War and State Departments, to the late Chinese minister at Washington, Mr. Chang-Yin-Hoon, in the year 1886.

With a kindness all his own, he translated the inscription and expounded it. With a politeness characteristic of his nation, he wrote Secretary Bayard, "I am indeed grateful to you for permitting me to *share* the pleasure of perusing this curious inscription."* The italics are ours.

COUNT WILLIAM DEUXPONTS.
(After Trumbull.)

From uncontrollable circumstances it has been impossible to obtain permission of the

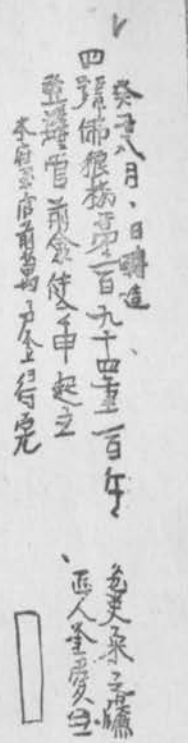
* In all the translations, the numbers in brackets indicate the vertical columns from right to left. A very unsatisfactory attempt has been made to phonotype important Chinese words by aid of the English alphabet. But twenty-six characters, most of them possessing several phonetic powers, and none of them indicating accent, pitch, inflection, or intonation, are a very inadequate vehicle to convey the phonetic values of a language in which scholars acknowledge fifteen consonantal sounds, twenty-three vowel and diphthongal sounds, and from four to eight inflections, and in which all articulation is, to an European, chanting rather than talking. Add to this that, while the written language is comprehended by all the erudite of China and Japan, the phonology of the characters differs in different parts of the Empire more than Homeric

minister to use the exact text of his communication, and it would be an impropriety to publish it without permission.

Other inscriptions on the Annapolis guns were procured later, kindly copied by the Japanese naval cadet Neri, and subsequently photographed by Professor Terry. All of them, with others to be hereafter referred to, were submitted to the well-known Chinese novelist and magazine writer of New York, Mr. Wong-Chin-Foo, and the translations made by him are employed.

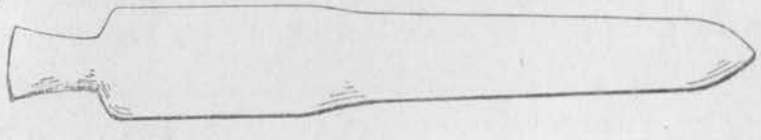
There is a substantial, almost a verbal and literal, agreement between the two translations of the Fort Monroe inscription, which reads as follows: —

[1] Kwei-Chow (fiftieth year of the cycle of sixty), eighth month, first day, *was* cast and made. [2] Fourth class Fu-lang-Khi (foreign machine), number one hundred ninety-four, weight one hundred catties. [3] Gien-Gi-Gwan (superintendent of the casting), *the* Tseng-Tsien-Shi (head assistant privy councillor of the third class) Shen-Khi-Lick. [4] Pen-Fu-Gwen-Gwan (ordnance general superintending), *the* Tseng-Wan-Hu (chief *commander of* 10,000 families = General of Division) Kin-Tack-Yuan. [5] District Magistrate, Sung-Che-Lien. [6] Master Mechanic, Kin-Ngai-Kuk (or Lik).



INSCRIPTION ON FORT MONROE SWIVEL.
(From a photograph.)

One of the Annapolis guns and its inscription may usefully be compared with this Fort Monroe gun and its inscription. Its modelling is almost exactly similar. The inscriptions are of the same length, have the same characteristics as to height of columns, employ the same forms of characters, use the same official formulas, and present the same names of public officers, who hold similar ranks, respectively, save in one

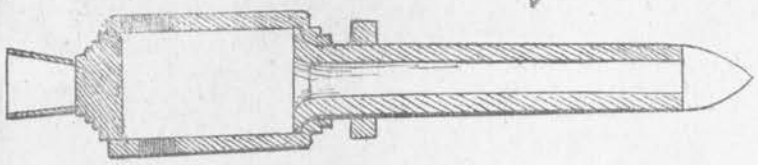


THE EVOLUTION OF A GUN FROM A SPEAR.
Fig. 1. A solid of revolution from a spear-head.

Greek does from Romaic, or than Venetian does from Neapolitan, Provençal from Norman, or the dialect of Devon from the burr of Staffordshire, and every scholar will see many excuses for a great particular disagreement about the phonology. The sense of the inscriptions is believed to be accurately given, and the sound of the important words proximately, and near enough to be of some assistance to the reader who dislikes to pass even a foreign word without trying to pronounce it.

A literal or proximate English translation, and in some cases both, follows the phonotyped words. Words which supply connections are in *italics*.

instance, and in his case there has evidently been a promotion. The date is nearly the same, but the serial number of the gun differs.



THE EVOLUTION OF A GUN FROM A SPEAR.

Fig. 2. The solid of revolution, *built upon, bored, recessed, and truncated, as shown in section.*

TRANSLATION.

[Col. 1:] Kwei-Chow, eighth month, —— day, cast. [Col. 2:] Fourth class, Fu-lang-Khi, number two hundred thirty-nine, weight one hundred catties. [Col. 3:] Gien-Gi-Gwan, *the* Tseng-Tsien-Shi, Shên-Khi-Lik. [Col. 4:] Pen-Fu-Gwen-Gwan, *the* Tseng-Tsien-Shi, Kin-Tack-Yuan. [Col. 5:] District Magistrate, Sung-Che-Lien. [Col. 6:] Master Mechanic, Kin-Ngai-Lik.

This date is the same, the eighth month of a Kwei-Chow year, in which month at least forty-six cannon were made. An average business of over twenty-nine cannon a month for the year is indicated. (No. 239= 8×29+7.)

Both these inscriptions lack the regnal title, and as that would, by Chinese etiquette, be elevated (potentially at least) one character higher than the next adjacent column on the left, and as the right-hand column is a character lower than the next adjacent column on the left, it is evident that a blank was left purposely for insertion of the regnal title.

The question to be solved in dating these two guns is this:

At what period of Chinese history did there occur a Kwei-Chow year in the eighth month of which a public officer might feel doubtful what regnal title he ought to employ in a Kwei-Chow date; a Kwei-Chow year when there existed an ordnance office called "Pen-Fu," with an officer in it entitled "Wan-Hu," and another entitled "Tseng-Tsien-Shi"? If we can find such a date, answering all these conditions, and can find only one such, it is the date of manufacture of these two guns.

We must look for it pretty far back, because the character, Haou, — separation or class, — is written in an old form, disused for two hundred and fifty years. We must do our work with a knowledge that, about two hundred and fifty years ago, a revolution obliterated the Ming administrative system, and that about five centuries ago the Mings obliterated much of the administrative system of the Yuans.


HAOU, LATE FORM.


HAOU, OLD FORM.

For two hundred years before the middle of the 13th century China was intermittently feverish with civil war, and her political history is for that time a barren waste of military annals, of the public biographies of generals, of descriptions of effete or vicious emperors, and of disasters.


PEN-FU.

Each of the other two guns at Annapolis presents an advanced mechanical feature on the construction of the Fort Monroe and Kwei-Chow Annapolis guns, which denotes their succession in time, or at least a higher instruction of the workman, — an improvement which could not have been lost after introduction.


TSENG-TSIEN-SHI.

This is a series of saw-tooth ratchets for reception of the toe of an elevating pawl, on the under side of the bottom plate of the breech box along its median line. These ratchets were modelled in the sand of the mould, and were therefore a part of the standard form of piece.

One of these ratcheted guns is not marked as classified, although of the same weight as the Kwei-Chow guns. It is not dated in terms of the cycle of 60, but only in a numbered regnal year of lower date and in coincident terms of the cycle of 60, and is of the 5th class. But the character for class is of the later abbreviated form instead of the earlier form of the Kwei-Chow guns. (See above.) The style of characters is less archaic on these ratcheted guns than on the Kwei-Chow guns; yet while the lighter and earlier of the ratcheted guns is inscribed in the style of scholars' script, the latest inscription is almost in the printing character. If we were to paraphrase the naming of these forms of characters, we should say the Kwei-Chow guns are inscribed in Black Letter, the lighter ratcheted gun in modern business script of the Spencerian or Duntonian style, and the heavier ratcheted gun in standard Roman.


TSENG WAN-HU

The dates inscribed on the ratcheted guns confess an antiquity of the Kwei-Chow guns greater than A.D. 1665.

The heaviest of the Annapolis guns bears a long inscription, which reads. —

Great Primer, No. 4. Boston Type Foundry.
(Leaded with "Fours." a to z, 12 1-2 ems.)

[Col. 1:] Kang-Hi, 19 year, 2 month, — day. [Col. 2:] Tung-Chi-Shi (military and civil provincials), Tien-Shi (whole body-of-officials) built Kiang-Du-Dun, *its* golden top, Fu-lang-Khi, number 24, weight, one hundred and one catties. [Col. 3:] Gien-Chi-Gwen-Gwan-ja (casting-making general magistrate acting), Chung-Shen-Ching. [Col. 4:] Tseng-Tuan-Gwan (chief managing official), Chow-Yi-Ho. [Col. 5:] Tseng-Wan-Hu (chief 10,000 families, General of Division, or General of Military Police), Kiang-Chun. [Col. 6:] Master workman, Yu-Show-Jin.

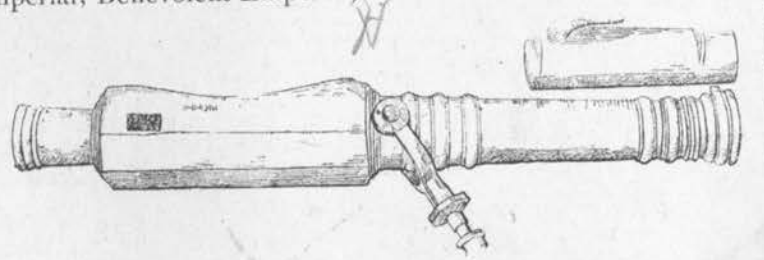
康熙

Kang Hi

Kang-Hi was the regnal title for sixty years, of the second Manchoo Emperor of all China. The date column of the inscription has eight characters, and a gap for a numeral between the seventh and eighth. It is spaced, therefore, for nine characters, the last of which falls opposite the eighth of the second column. The top of the first character of the first column is elevated above the top of the first in the second column. Present etiquette would require this elevation to be more pronounced, as may be seen by a page of a printed book given later.

This emperor came to the throne at eight years old, A.D. 1662. His nineteenth year began in February A.D. 1680. His temple title, by which he is known to posterity, is Shên-Tsu-Jen-Hwang-Ti (Godlike, Imperial, Benevolent Emperor).

He was partly educated by Father Schaal, a Jesuit missionary, who had been his father's tutor, and who held, on the demise of the crown, official position in the Board of Mathematicians.



ANNAPOLIS GUN OF 1680, DISMOUNTED.

China was governed by a regency till 1666, under which, things went

very much to the bad. The missionaries were disgraced and imprisoned, and Father Schaal sentenced to death. The Emperor discharged the regency, and began to govern, as well as to reign, when he was twelve years old.

Most modern writers on China assert that at or about this time the casting of cannon was introduced into China, and was taught to the Chinese, by the Jesuit missionaries.

The story, as told by Duhalde in the chapters "Cang-Hi," "Military Government," "Nobility," and "Astronomy," Brooke's translation, 3d edition, London, 1741, hardly warrants so strong a statement.

He acknowledges bombards at the gates of Nanking, and "pettereroes" in the buildings on the seacoast, but asserts there was not skill enough in China to make use of them.

SPECIMEN PAGE OF CHINESE BOOK.

He relates that in 1621 the city of Macao presented the Ming emperor Tien-Ki with three guns, and that Portuguese engineers were taken into service to manage them. In 1636, under the last Ming emperor, while a religious persecution was going on, Father Schaal was entrapped into saying that he knew the *European method* of gun-founding, and was ordered by the Emperor Tsung Chêng to train some workmen in this art, and was assigned a proper place in the palace and allowed assistants from the Imperial retinue. It is not claimed by Duhalde, nor by any contemporary writer, that Schaal made any guns under this order. The records of the church disclosed, however, that use was made of it to introduce "Evangelical workmen" (missionaries?) into China.

J. F. Davis, however, in his "History of China and its Inhabitants," published in "Harper's Family Library," 1836 (vol. i. p. 50), gives a transcript from the English Company's record at Canton, by which it appears that the Chinese mounted in the Canton forts, and that the English captured in June, 1637, forty-six well-proportioned pieces of cast-iron ordnance weighing six or seven hundred weight each. These should be about four- or six-pounders.

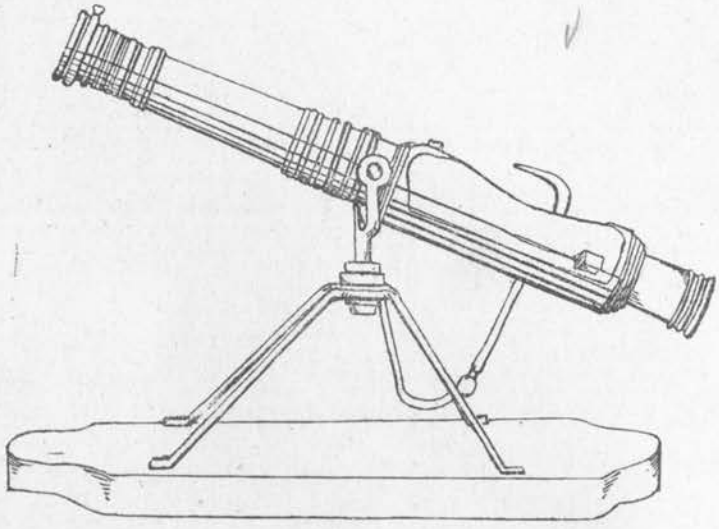
Whatever Father Schaal did, all trace or recollection of it had disappeared before the reign of Kang-Hi.

In A.D. 1664, Fathers Schaal and Verbiest were sent to prison and put in

fe. ; and Father Schaal was condemned to death, but was pardoned and released, and died Aug. 15, 1666, aged seventy-seven years.

Before this date of August, 1666, Father Verbiest and other missionaries were taken out of prison, and, under the Emperor's orders, demonstrated in presence of the court, with improvised instruments, that the official astronomers who had replaced the missionaries, had by neglect and ignorance disordered the calendar and misplaced the fixed national festivals, and the times of seeding and harvest home. Verbiest was ordered to examine the calendar and to point out its errors, and he became President of the Board of Mathematics in 1669.

He then adapted European astronomical science to Chinese methods of thought, and made tables, ephemerides, and rules of calculation for Chinese mathematicians. He devised and modelled instruments for the latitude of Peking, and established the national observatory and almanac on a solid



GUN OF 1680 AS MOUNTED AT ANNAPOLIS.
(From a photograph.)

basis of accuracy, connecting it with the work of Europe. He made and presented to the Emperor in A.D. 1678 the perpetual astronomy of Kang-Hi, in thirty-two large volumes of tables and text. The work of the desk had occupied him till this year.

He caused to be cast (but whether before or after 1678 is not clear) a quadrant, a sextant, an armillary sphere, a celestial globe, an azimuth instrument, and an equinoctial sphere, six great bronze measuring implements, each weighing more than a ton, decorated with sculptures of lions and dragons in the national style. After this metallurgy, probably in 1679, under an order to cast some cannon, he cast 130 "with great success." Later, after A.D. 1679, he received an order to cast 320 more, for which he

submitted models in February, 1681, which were approved, and the cannon cast. Some Chinaman tried to disable one of his guns by jamming a shot in the bore before it was "polished" inside. This shows they were probably cored castings: for if cast solid, a different word would have been chosen. Verbiest loaded the piece through the vent and blew out the shot. This enables us to say that Verbiest's guns were muzzle-loaders. Had they been breech-loaders and a ball had been wedged in the piece proper, it could have been driven out by drifting, or by a powder charge in the breech-block or cartridge case. If it had been wedged in the cartridge case, it need not have been fired out at all.

Father Ferdinando Verbiest, Chinese Missionary.

Duhalde is explicit also that all Verbiest's guns were made in the palace at Peking. They were all sanctified, and named with saints' names properly inscribed on them in the foundery. The earliest were made in 1680, because the Emperor said in 1682, when the lot of 320 were proven by firing about seventy shots each, — 23,000 in all, — at a mark, "The guns you made me *last year* were very serviceable against the rebels."

The nineteenth-year Kang-Hi was 1680. It was a year before Verbiest began on the lot of 320, but the same year in which he executed the order for 130.

This gun lacks the Verbiest's characteristics, and possesses some which his guns lacked. It is a breech-loader: his were muzzle-loaders. No saint's name is marked on it: all his were so marked. Among the four names of persons on it, Verbiest's Chinese name of Nan-Hwei-Jin does not appear. No provincial general officer (Tung-che) had anything to do with Verbiest's palace foundery, but it was the Board of War and Board of Works to whom Verbiest looked, by permission of the Emperor and of his superiors in the Board of Rites and Ceremonies.

The gun was made for Kiang-Du-Dun (the river capital fort). Duhalde gives the information in his volume 3, the first of the short histories, that the

deputy magistrate of Kiang-Tu had a residence at Yang-Chow. This fort was probably one of the defences of the great canal.

We may now English the inscription thus:

In the second month of the nineteenth year Kang-Hi (about March, 1680), the provincial general officer and all the civil magistrates built for the barbette battery, near Yang-Chow, breech-loading wall piece No. 24, weight one hundred and one catties; general in charge of the casting, the acting magistrate Chung-Shen-Ching; chief supervisor, the magistrate Chow-Ye-Ho; chief of military police, Kiang-Zin; master mechanic, Yu-Show-Jin.

統營所

TUNG-YING-SO.

This gun with its inscription proves that in A.D. 1680, there was an indigenous Chinese gun-founding industry capable of making breech-loaders, which owed nothing to the European Jesuits, and that this industry was practised at Yang-Chow to a considerable extent in that year, and that the Chinese used an elevating pawl and ratchet for getting proper range for the guns.

A Kwei-Chow year fell in the reign Kang-Hi in 1673, but the absence of the elevating ratchet on the Kwei-Chow guns, while it is present on the guns of 1665 and 1680, relieves us from considering that as a possible date.

朱后軍

Bun Fu Kwan

THE GUN OF 1665.

The most modern-looking of all the guns is the lightest. Its inscription is in the most modern text also. It has the ratchet for the elevating pawl.

The inscription reads: [Col. 1:] Kang-Hi, fourth year; Yih-Chi [42 of the cycle of 60], fourth month, —— day; Tung-Ying-So (the military supervision executive office — cast. [Col. 2:] 5th-class Fu-lang-khi No. 19; weight, eighty-eight catties. [Col. 3:] Gien-Chi-Gwen-Gwan (casting superintendent general), Shên-Khi-Lik. [Col. 4:] district magistrate, Li-Shen-Jing. [Col. 5:] master workman, Kin-Ngai-Bong.

We have here a different formula. The date is about May A.D. 1665, which is determined by the regnal year, fourth, and by the cyclical words Yih-Chi, which denote the 42d year of the cycle of 60 then current, of which A.D. 1624 was the first year.

前萬戶

TSENG-WAN-HU.

At this date, A.D. 1665, we are explicitly told by Duhalde, the persecution of the missionaries was at its height; Father Schaal was in prison, and was soon after sentenced to death, and Verbiest was "loaded with nine chains."

There is only one supervisor mentioned, not two, as on the Kwei-Chow guns, or three, as on the gun of A.D. 1680. He is, however, a Gwen or high military officer, as Kin-Tack-Yuan was on Kwei-Chow guns, but he has no

title, either of Tseng-Wan-Hu or Tseng-Tsien-Shi, as Kin-Tack-Yuan had, and he is not a Pen-Fu general as Kin-Tack-Yuan was. On the contrary, the office in charge is a Tung-Ying-So, which, though Imperial (Tung), is military (Ying), and is a So, of much lower grade than a Fu, which is both civilian and military, as a designating epithet.


員勳四相六部九卿十三科道內外大小功臣山呼萬
歲朝見君皇聖上傳旨卽賜卿等平身隨開金口說道
朕今仰承
列祖
列宗菩蔭賴你大小臣工之力
上天眷祐風調雨順國泰民安坐享太平實乃萬民之福
朕自偶然想得一對汝等眾卿爲朕對來重重有賞眾
大臣齊聲答道陛下有何妙對懇求御筆書下賜與臣
等一觀聖上開言卽命內侍捧上文房四寶濃磨香墨
揭撫金箋御筆寫出上聯云

SPECIMEN PAGE OF CHINESE BOOK.

In A.D. 1665, the Manchoo supremacy in China was in jeopardy. True, the boy Emperor was suzerain, and ruled directly most of the northern provinces, yet three vassal kings, each nearly as powerful as the Emperor, held most of the southern provinces. They owed him homage for investiture, hardly anything else. Each maintained a large army. They controlled the tea crop, two thirds of the rice crop, all the foreign commerce. Each hated the Tartar. Cheng-Chang-Kung, the sea king of Formosa, had died in 1662 or 1663, and, while his pirate subjects no longer swarmed in fleets and squadrons, single ships or small flotillas from his island still ravaged the coasts of the maritime provinces. The sea fishery was annihilated, and a depopulated and ruined belt, nine miles wide, bordered the strand of China.

KANG-HI.
(After the Duhalde engraving.)

Wu-San-Gwai, one of the vassal kings, was training his army and consolidating his power by wars along the southern frontier. The doctrine of "China for the Chinese" had grown from a hope to an aspiration, almost to an expectancy. The court was seamed with contention and intrigue. The administration was in popular disrepute from a disordered calendar which had required correction by proclamation and the dropping of a month from the year.

The Emperor's Manchoo and Mongol subjects could not have given him a movable army of over two hundred and fifty thousand men, even if we allow the eight banners to have aggregated 600,000. Garrisons, national and local ...ce, the posts, the grain transport, the palace guard, the commissariat,

would absorb two thirds of the forces at least. The Chinese banner men could be trusted only in the garrisons of the wall and the sea-coast.

The plot ripened in 1673, but the disruptive forces failed to act together.

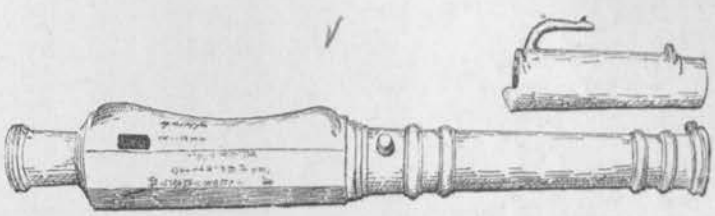
Keng-Tsing-Chung, King of Fokien, was to be supported by Cheng-King-Mai, Prince of Formosa. Neither this prince nor his father had ever been liegeman of the Tartars. His principality had been conquered from the Dutch. So, though his father was a born subject of Fokien, he not unnaturally claimed admission into the confederacy as an equal. When treated as a vassal of Fokien, he proved his independence by repeatedly beating the army of Fokien in battle, and forced the king to appeal to the Emperor for help, and to receive Tartar garrisons, and surrender his sovereignty for the position of governor under the Empire.

Father Adam Schaal, Chinese Missionary.

The army of Keng-Tsing-Chung was taken from him and employed against the other rebels, and in 1681 he himself was executed with ignominy, and his brothers beheaded.

Shang-Ko-ho of Quang-Tong was reluctant to change a defined and lightly pressing allegiance for the indefinite burden of civil war. His reputation, ability, or power gave him no pretence to the throne itself. Wu-San-Gwei did not offer the leading position to him, so he held back his troops and prevented his son, Shang-Chi-Sin, from joining the revolt. The son, after the father's death, saw the situation more clearly, and led his army to the Emperor's aid. The Imperial necessities required this army of reserve to be divided and sent by detachments to reinforce widely separated Imperial armies. Shang's dignity refused the post of division general under a Tartar chief, and he returned home. On October 9, 1680, Imperial messengers presented him with a stout red silk cord and with an Imperial sign-manual permitting suicide. The arch-traitor solaced himself in simulating a voluntary death, by the princely color and material of the Emperor's

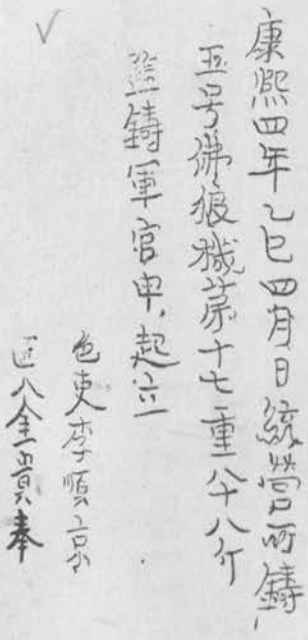
anaretic gift, and died like a king in a red silk halter, which ended his life and his kingdom at the same time. Some of his family had been faithful to the Tartar. One of them had made an Imperial marriage. They became rich from the wealth of the suicide. All other relations were executed. Quang-Tong became a province of the Empire.



ANNAPOLIS GUN OF 1665.
(From photograph by Professor Terry.)

Wu-San-Gwei had been a general officer and military governor of Laow-Tong, on the northeast of China, beyond the wall, as early as 1643. When the rebellion against the new Emperor, Sung-Cheng, broke out and the Imperial armies fought the rebels only to be defeated and to transfer their allegiance, when Peking fell, when the Emperor hanged himself in his yellow girdle, Wu-San-Gwei was the last of the faithful. When the power of the usurper was stayed before his army, Wu's aged father was brought up and threatened with ignominious death if the soldier son should not abandon the cause of the Ming who had trusted him. With grief, but with paternal approval, he preferred loyalty to filial piety. The father was cruelly slain between the two armies. Wu then made peace with the Manchoo and in their alliance crushed the Chinese rebellion, but not for the benefit of the Mings as agreed. The Tartar took the yellow robes and dragon stomacher and gave to Wu a vassal kingdom in the northwest. Wu reduced to allegiance Chensi, Sechuan, Kwei-Chow, Yunnan, Quang-Si, and part of Ho-Quang, the garden-spot of the Empire, set up an administration in each, and restored order. He defined, and fortified by a chain of posts in the mountain passes, the southern frontier towards Burmah and Annam. He had thus done most of the work in quieting the Empire. He had, in 1673, a seasoned army and vast resources.

軍
Kwen.



INSCRIPTION ON GUN OF 1665.
(See page 90.)

The last titular Ming Emperor had sought an asylum in Pegu. A military embassy accompanied by a Manchoo army had obtained his extradition.

Extradition and death were separated only by the interval from Pegu to Peking.

Wu-San-Gwai AD 1643 to 1668.
from a Chinese print

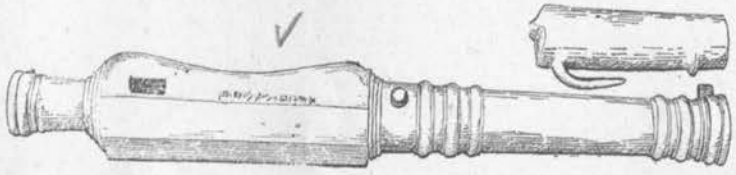
Wu-San-Gwei had all this time been looking for a national spirit to arise which should bring together in one common cause all men of Chinese blood, to restore home rule to the nation. With a confederacy which should include the power of the western half and of the southeast quarter of the Empire and the command of the sea, all loyally joined for national independence against a boy emperor of foreign race and a divided court, success was certain. Wu's right to lead the movement was generally admitted. He got the promises of the princes of Quang-Tong, of Fokien, and of Formosa, for a set time. He proclaimed himself Emperor in 1673, published his Imperial almanac, and sent it round.

KWEI-CHOW.

Rival ambitions at once asserted themselves. Formosa quarrelled with Fokien, and both fell away. Quang-Tong, on reflection, preferred the Tartar.

After six years of wasting power and waning hope, in a weary civil war, where treachery and intrigue gave more victories than arms, the patriot died in A.D. 1679. His son and successor continued for two years the unequal strife. At last, driven to the southwest corner of the Empire in Yunnan, the son of Wu-San-Gwei committed suicide in 1681, thus leaving the Manchoo without a rival during the rest of the reign Kang-hi.

This review of the struggles of Kang-hi for the throne in his first twenty years shows us conclusively three things:



KWEI-CHOW GUN AT ANNAPOLIS.
(From a photograph by Professor Terry.)

1. Independent of Verbiest or of Schaal there was a native Chinese bronze-founding industry, capable of making serviceable pieces of good model, occasionally at work in China, not only at the very time when Verbiest's work was going on, but before; not

only when it was called into activity by provincial officers Tung-Che-Shi, Tsien-Zhi, but also in earlier times, apparently, by a central bureau (probably of the Board of War) called Tung-Ying-So, a phrase which seems to mean the establishment (So) of the military household (Ying) intrusted by the Emperor with manufacturing (Tung); in other words, by a national armory.

2. The demand for artillery after 1673 was pressing, and Father Verbiest helped the Chinese artisans with guns of European style, probably also with field-carriages, and certainly with some instruments for aiming more accurately, perhaps with a new powder formula.

3. The Kwei-Chow guns were of older date than 1673, but the skill of their makers had not been lost.

ILLUSTRATION FROM CHINESE HISTORICAL ROMANCE, DEALING WITH THE REIGN OF KANG-HE.

Two notable Chinese scholars, Mr. W. F. Mayer of the British diplomatic service, for many years Chinese Secretary at Peking, and Rev. Dr. Edkins of the Peking Mission, have given a careful study to this subject, and when one differs from them, or from either of them, — for they do not absolutely agree, — caution is required.

Mr. Mayer read in 1869 to, and published in the proceedings of, the North China Branch of the Royal Asiatic Society, an elaborate illustrated paper, which is in the Boston Public Library, No. 5019.1. This paper was published separately in 1872. A copy of this edition is in the library at Fort Monroe.

His argument, briefly stated, traces, as Colonel Favé, the author of the principal part of the Emperor Napoleon III.'s History of Artillery did, the use of gunpowder to the fire-cracker. Mr. Mayer dates this invention at about the 5th to the 7th century A.D., and admits the use of gunpowder in other fireworks before the 11th century.

He states that the Sung historians assert the use of projectile carriages, fire-stones, and a fire-drug, composed of saltpetre, sulphur, and willow charcoal, before A.D. 1164, but does not admit that the propulsive effect of gun-

powder was thus early utilized. He admits the use of hand granades as early as A.D. 1232, in the Kin-Mongol wars, and of "fire spears" and "fire ballistæ" in A.D. 1292, but does not admit these to have been guns. He does not admit that the Mongols had any gunpowder weapons, but states that these first appear shortly before the time of Yung-Lo, under the Mings. This monarch, when Prince of Yen, was defeated in 1401 by artillery, and later equipped his own armies with gunpowder weapons, both rockets and guns. The artillery was, according to Mayer, kept a state secret, its manufacture confined to the capital, and was not introduced into the army till after the reign of Kila-Tsing (A.D. 1522), which was later than the arrival of the Portuguese in China. The Portuguese guns were iron breech-loaders, had several removable chambers to be loaded separately, and used successively, and these guns were called "Fu-lang-ki," under protest of the Chinese historian, who said, "Fu-lang-ki is the name of a country and not of cannon." These Portuguese guns were wooden-cased, and hooped with metal. It is admitted that firearms and rockets were made and used against the Manchoos in the 17th century, but it is claimed to be tolerably clear that the use was not by any means universal.

O UNT DE VIOMESNIL,*
Marshal of France, 1876.

BARON DE VIOMESNIL,*
Maréchal de Camp. Killed 1792.

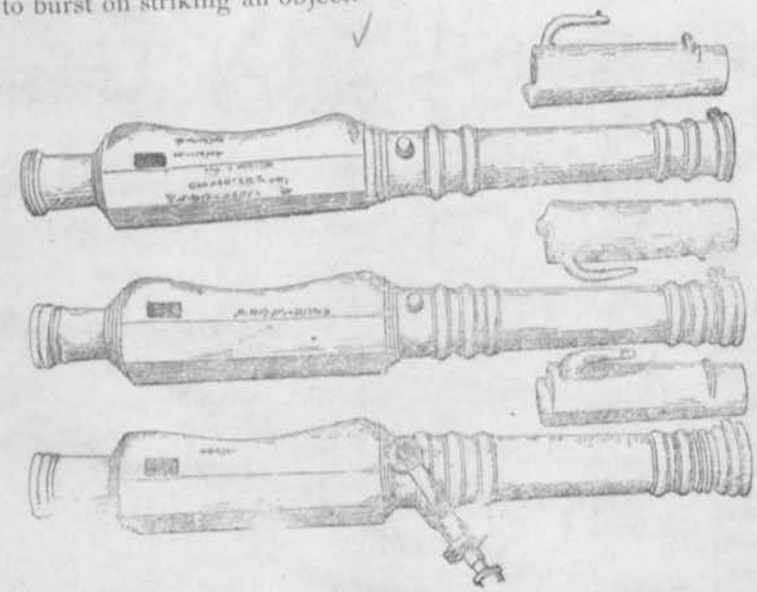
Dr. Joseph Edkins differs from Mr. Mayer in many particulars. In an article published in "Ordnance Notes," No. 312, Washington, July 6, 1882, he says that the Ming history states that the Mongols first used the Western cannon, called "Pao," at the seige of Tsei-Chow, A.D. 1234. The Ming historian also said that the

NOTE.* — The contradiction of testimony between Marshal Ney and Bernadotte's biographers as to the presence in America in 1781 of that French general of vanguard, general in chief, minister of war, marshal, Prince of Pontecorvo, Crown Prince, and King of Sweden, may have left the statement about four marshals expectant present at Yorktown in doubt.

To the list already given another is to be added: A cousin of the Baron de Viomesnil,

Western weapon fell into disuse, but was recovered during the conquest of Cochin China early in the 15th century. In the Kin history, under a date corresponding to A.D. 1259, a fire-exciting hand-gun (tsiang) (literally *spear*) is mentioned.

This is described as made of large thick *bamboo*. A charge was placed in this, which, when fire was applied, issued with a loud report which could be heard for more than 150 paces. "The charge," says Dr. Edkins, "seems to have been a hollow ball enclosing something else, and was probably intended to burst on striking an object."



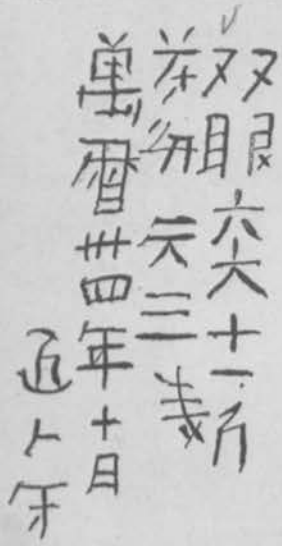
THE THREE ANNAPOLIS GUNS SIMULTANEOUSLY PHOTOGRAPHED.
(Gun of 1665 at top, Kwei-Chow, centre, 1680 at bottom.)

The phrase of the Ming history for artillery, Si-vu-pao (Western guns), and the phrase of the Sung history, Hwei-hwei-pao (Mahometan cannon), are said to signify Mussulman equally, and to indicate the attribution by the Chinese of an Arabic origin for cannon.

Both these scholars agree that the Mongols or Yuan dynasty had no artillery.

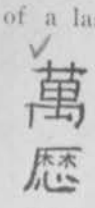
called the Chevalier, was there present, and was promoted in 1782. He became head of the family and count, emigrated, was attached to the court of Louis XVIII., returned at the first restoration, and took his place in the army as lieutenant-general. He attended the fugitive king to Ghent in the hundred days which comprised the Waterloo campaign, and when the French army was again reorganized in 1816, his faithful service to royalty was rewarded by the marshal's baton. We may reject the testimony of Ney (see note *ante*, p. 35), and still the numerical statement of page 11 will remain undisturbed. While he never was a Grand Cross of the Legion of Honor, which would have given him a star of ten points, each with a globular tip, to wear on his left breast, and a broad red ribbon from right shoulder to left side, he had the royalist order of the Holy Ghost.

Colonel Favé, to whom was intrusted the completion of the treatise of Napoleon III. on artillery, made elaborate search of the Arabic authorities, and also paid some attention to the Chinese. He mentions a gun of the Sung period, 14th century, as a to-lo-tsiang, which he renders "furious firing spear," and which is, doubtless, the same weapon spoken of by Dr. Edkins as the "fire-exciting spear." The charge, according to Favé, was a "nest of seeds," which he is powerless to explain.



If Admiral Rodgers brought nothing else back from Corea, he brought the explanation of this passage in a curious gun now in the museum of the Charlestown navy yard.

This gun is of brass, about eighteen inches long. It has a socket cascable and no trunnions. It is modelled on its exterior to resemble a pair of bamboo stalks fused together, and has three reinforces on each barrel which resemble bulbous root knots characteristic of some species of this reed. Each reinforce has a vent, those of the right barrel on top, those of the left barrel on the left side. The hollow cascable bears an inscription which is much worn, and the metal surface is grooved in places as if from the wear of a lashing cord. Part of the inscription, particularly the second column, is quite illegible. The first, third, and fourth columns present few difficulties.



It seems to read (Col. 1:) "Double-sighted six-shooter, eleven catties. (Col. 2:) The Tea Prefect of San-Chuen. (Col. 3:) Wan-Li, thirty-fourth year, tenth month. (Col. 4:) Master Workman, Chu.

Wan-Li was the regnal title from 1575 to 1620 of an emperor in whose reign the Japanese invaded Corea. Duhalde relates of this war that in 1593 a general's horse was killed by a cannon shot, and that in 1598 a cannon was shot off as a signal. Griffis' "Mikado's Empire" states that *a breech-loading cannon* is still preserved in Japan as a relic of this invasion.

Here, then, we have the furious-firing or fire-exciting spear with its "nest of seeds" and its "bamboo barrel" spoken of by Favé and by Edkins, and this gun illustrates the passages of the old histories.

We find on this gun of 1607 no mention of a Pen-Fu department, no reference to the Tung-Ying-So as on the gun of 1665, but only a statement

in the first column that it is a double-sighted six-shooter, and in the third that it was made in the 34th year of the reign of Wan-Li. The fourth column gives merely the name of the artisan, Chu. The second column is therefore the column of information. This is very nearly obliterated. Extensive but probable restoration makes it read Tcha-Fu-She, San-Chuen, the Tea Prefect San-Chuen, or of San-Chuen, or the magistrate of the tea department at San-Chuen.

LOUIS XIV.
(From a [illegible].)

San-Chuen may be the name of a man or of a town. A town of a like phonology, perhaps of the same ideography, is mentioned by Burrow as situated on the head waters of the Chang-Tang-Kiang in the province of Chên-Kiang in the tea-raising country. This magistrate was not a subordinate of the Board of War or of the Board of Works, but was a provincial intendant or prefect of the revenue from teas. Surely, then, under the decentralizing policy of the Mings, there was in the Kwei-Chow years of 1613, and probably also, from this evidence, of 1553, no centralized Ordnance Office. At any rate, the Shen-Ki office of the Mings is as unmentioned as the Pen-Fu of Yuan, and the only official named is a provincial officer. We may then accept the concurrent testimony of Mayers and Edkins that gunpowder weapons were rare and were not very systematically used under the Mings, and turn to the West for information.

ARROW OF CATHAY.
After Favé.

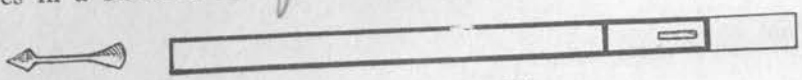
Colonel Favé's researches, published in the elaborate treatise on artillery, begun by the Emperor Napoleon III., showed that saltpetre was mentioned as "Chinese snow" in the Arabic medical dictionary of Abdallah Ibn Alboythar of Damascus as early as A.D. 1240. Before the end of the 13th century, the cracker and ground rocket or squib had become children's toys, directions for collecting and refining saltpetre had been given, and the formula of six parts nitre, one of sulphur, and two of alder or willow charcoal had been published as the standard for explosive compounds.

PYROTECHNIC MACE.
After Favé.

The prescription of this charcoal implies considerable study of the quality of materials.

As early as A.D. 1295 the treatise of Nedjeddin Hassan Alearmuede on cavalry combats and machines of war, gave to the world the traditional lore of a family or guild of fireworkers, and concedes the Chinese origin of the rocket by noticing it and illustrating it as the "Arrow of Cathay." Pyrotechnic clubs and spears are noticed, but no guns.

In a later Arabic writer on the art of war, who mentions the use of pyrotechnics in a battle at Edessa between an Egyptian force and the Mongol



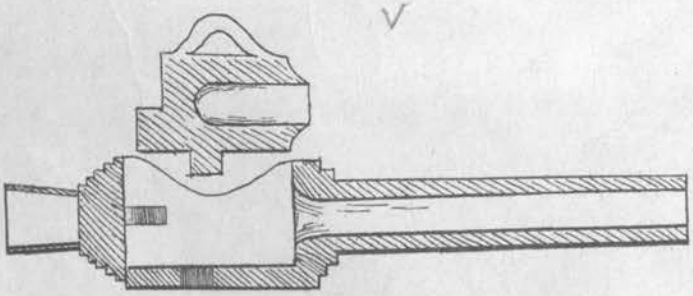
ENLARGED DIAGRAM OF MADFAA.
(After Favé.)

Khan Gazan (the substitute bridegroom of Polo's princess), the date of which was about A.D. 1300, a wooden mortar is described with a bore as deep as wide, and with walls a calibre thick, to be used in projecting a ball by the force of an explosive composition. The ball was called a "bondoc," which afterwards became the name of a firearm, and "bondoctar" became the Mameluke title of the Mameluke prince's gun-bearer. This was the old pyrotechnic mace charged with a quicker composition, and was a rude Roman candle. The explosive compound was a gunpowder composed of ten parts of nitre (74.074%), two parts of charcoal (14.84%), and one and a half parts of sulphur (11.111%). Such a composition would be a fair blasting powder.

A further description and an illustration is given of a machine of similar principle, to fire horizontally. The art of mechanical description was imperfect in those early days, and in passage from Arabic to French, and thence to English, and probably also originally from Chinese to Arabic, much of clearness has probably been lost. But there was a diagram, an enlargement of which is here given.

A spear head and shaft were to be perforated longitudinally. A notch about four fingers wide was to be cut in the shaft for the insertion of an iron "madfaa," which was to be properly adjusted to the bore, and tied in place through holes in the shaft and itself by a *raw-silk cord*.

The cascable of the Charlestown repeater shows the unmistakable grooves



THE EVOLUTION OF A GUN FROM A SPEAR.

Fig. 3. Showing the adaptation of a mortar to the cavity of fig. 2. (see p. 84).

of a cord lashing used to fasten the gun to a staff. The hollow cascables of all the Chinese guns are peculiar to them. All the European guns of

this breech mechanism seem to have solid cascables. Several have been illustrated herein. The word "madfaa" is probably the crucial word, the key of this whole matter. No etymology has yet explained it. The explanation now given shows that "madfaa" was not the name of the weapon, but that the Arab author believed it to be. The diagram of the gun is as good a diagram as Benton's in the United States Ordnance Manual, and indicates that some one who had seen the weapon had sketched it and described it. Three hypothetical sketches have shown the evolution of a gun from a spear. The description given to the Arab had not been very well understood, because it had been imperfectly translated to him.

How do we know that a Chinaman was the original describer? The word "madfaa" is not Chinese, but it evidently came from a Chinaman.

The Chinese vocable for cannon and for ballista is "pao." Nowadays, when used for cannon, it is written:  signifying fire (*ho*):  , and wrapped up (*poa*)  . Formerly it was written:  signifying stone (*shih*)  , wrapped up. But still more anciently it was written:  , signifying a stone striking  *poa*, a horse  *ma*.

The character *poa* may be further analyzed into  *ta* and  *pa*.

The structure of the Chinese written character is such, and the Chinamen are so taught the elementary knowledge corresponding in their schools to our grammar, that an analysis of characters gives elementary ideas and not elementary sounds. Hence, while we analyze the character to the elements *shih*, *ma*, *ta*, *pa*, the *shih*, *ma*, *ta*, are not phonetic elements, but thought elements.

The structure of the Semitic languages is such that phonology both of vowels and consonants, and particularly the latter, is of the last importance. That the elements of a monogram — and all Chinese characters are monograms — should have no phonetic value, is inconceivable to a Semite.

Let us suppose an Arab seeking for information, a Chinaman possessed of it, each skilled only in his own language, and an interpreter between

them skilled only in the business vocabulary of one language, perhaps foreign to both the tongues of the principals. The diagram is drawn and an attempt is made to explain it. We know that the hand fire weapon was called a spear in China (*tsiang*) to a much later period than early in the 14th century. We know the projectile engine to have been called *pao*. We know that the early ideograph signified a stone smiting a horse. The Arab asks to have the name written down, and it is written 砲 (POA). "Make him explain the letters," says the Arab. "Of course," says the Chinaman; "馬 (MA.) that is *ma*, 大 (TA.) that is *ta*, 八 (PA.) that is *pa*," sketching each letter as he makes it. "Oh, yes," says the Arab, "Mat-pao, or Madfaa." "Pao," says the Chinaman, "the horse-striker."

"How these Chinamen clip the beginnings of their words!" says the Arab. "'Madfaa' it clearly is;" and so he writes it for the temporary confusion of posterity.

The etymology which is unexplainable has become clear from Mr. Mayer's revelation, and the error of the Arab has demonstrated, better than even his correctness would have done, the Chinese origin of the Arab's information.

CHEVALIER DU CASTELEUX, MAR. DU CAMP.

Chinese snow is nitre. Arrow of Cathay is a rocket. Madfaa, as a name for a gun, is of Chinese origin. The raw-silk lashing used in fastening together parts of this instrument is a Chinese cordage, and we have proof of the use of cord lashings in the Wan-Li repeater.

Our Western evidence leads us to believe that gunpowder weapons were in use in China as early as A.D. 1300, —breech-loaders with hollow cascables. We have had under discussion no less than five bronze breech-loading guns with hollow cascables. Although castings, they have bands, mouldings representing rings or thimbles, and a box at the breech that seems as if built on to the tube of the gun.

This implies a wrought-iron ancestor, as the waist buttons at the back of a dress coat and its cut-away tails memorize the days of looping back the skirts, and as the gorget on the breast of the captain of the Ancient and Honorable Artillery of Boston, or at the neck of Peele's Washington, is a survival of the cuirassed breasts of Granby, Ligonier, and Montagu, and of the pictured panoply of Argyle.

PEELE'S WASHINGTON.

MONGOL ERUPTIONS FREQUENT ETHNIC PHENOMENA.

History has recorded several eruptions of Asiatics from their central table-lands into the more thickly settled regions of other races. Ethnic study and archæological investigation has determined that the recorded eruptions were preceded by others, of which dates and details are lost, and traditions have faded away, but of which the traces are as distinct as the rock markings of the great ice age, and the relics as prominent and clear as the moraines of that far-off period.

At least a thousand years before any other people had thought that a chronological era was of importance, an intrusive Egyptian dynasty had begun to date from Nub, their golden king, Apepi. The spade and pick of modern archæology has ascertained the Mongoloid features of these Hyksos, the investigations of our modern scientists have ascertained the Mongoloid character of their minds and methods.

HEAD, FROM HYKSOS SPHYNX AT TANIS, PROBABLY APEPI.

Aliens dominating, by a military force of their own blood or of their educated captives in war, a sedentary people skilled in the arts of peace, they conformed to the manners and etiquette of Egypt, practised the form of Egyptian worship, and seem to have been polite and skilful sovereigns. History knows of their arrival and their departure, and knows not the whence or the whither of them, but will probably affiliate them with the Hittites.

In Europe to-day, the Finn on the shores of the Baltic, and the Basque

on the bay of his own name, by language and by physique bear testimony to a prehistoric migration from the steppes, an ethnic tidal wave of which they are the farthest jetsom.

HYKSOS HEAD IN BOSTON MUSEUM OF FINE ARTS.

The peculiar religious thought of Rome, sceptical of divine guidance while credulous of divination and sorcery, cynical in its contempt for the divine, which yet practised forms and ceremonies, and held festivals, and offered sombre and cruel sacrifices in superstitious awe to the malignant deities of the under world; the Constitution of the Roman State, which derived the popular sanction from the army assembled in *comitia centuriata* on the drill-ground of the city (*campus martius*); the Roman genius for organization, administration, and orderly government, — have been generally attributed to the Roman inheritance of Etruscan blood and traditions. The argument that the Rasenna were another Ugric colony which had been crowded from the steppes, and had moved as an armed caravan into Europe, keeping its tribal organization and purity of race for a long time, has been very conclusively advanced by the learned Isaac Taylor.

The Mongoloid affinities of the Parthians are generally admitted.

Herodotus has recorded that the Scythians invaded the Mesopotamian valley, and were worn out and exterminated in the Syrian mountains and the Phœnician lowlands.

A thousand years later, over the Urals, up the Danube, and across the Rhine, the war-spite of the Huns swarmed resistless, till it met and recoiled from the Roman and Gothic power on the plains of Chalons. This Mongoloid power for about a century and a half had something like constancy, transmission, and succession, and the Tartar colony of Hungary rightfully traces its origin to the comrades of Attila's successors.

Parthian statuette (after Isoltes).

Four or five hundred years later the Turk and the Mongol left the steppes and marched east, west, north, and south against the world. For some hundreds of years the internal

ferments of the steppes had from time to time induced tribal overflows under leaders of various nationalities, but from the birth of Zenghis to the death of Tamarlane, a period of about a century and a half, the organization for external war was systematic, elaborate, universal, and practically under military control, and that control Mongolian. These invasions flowed unbridled and resistless, eastward till they crossed the Pacific sea beach and shattered their power in a fruitless effort against Japan; south till the Mogul ruled at Delhi as emperor of Hindustan; west till the Tartar horses drank in the Danube and the Tartar cavalry patrolled the Oder, and till on a more southern route Tamarlane gazed at the shores of Europe across the straits of Bosphorus and Dardanelles.

Coin of Phraates I.

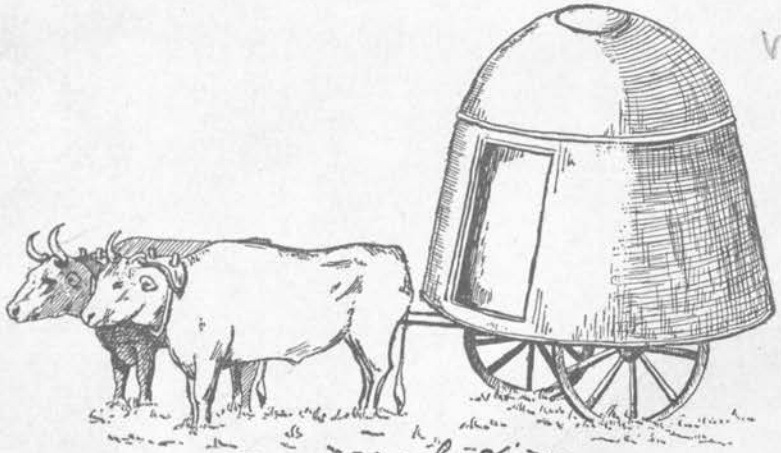
Arsaces I.

In sight of their waters the bands as yet unquelled by steel or cunning were stayed, because they lacked the sailor's art and the engineer's skill to vex these with keel or float. Before the prowess of the invader the fanaticism of Arabia was quelled, and the Tartar snatched and retained the sceptre of Haroun.

Coin of Pacorus II.

The valor of the Turk was pushed to extremity, and Russia reaped like an inheritance.

The historic outbreaks, and doubtless the prehistoric also, were the swarmings of a nomad people, combined to seek new pastures and more room.



Tent Cart of the Steppe.

Cæsar, one of the most competent observers and clearest of writers, has

NOTE. — All the illustrations of coins are taken from Rawlinson.

described such an affair in his early campaign against the Helvetians, and his account doubtless gives the outlines and many of the details of all the early tribal migrations.

COIN OF PHRAATACES AND MOUSA

The nomad is always girded for war, and his daily and usual life is a campaign.

Flocks, herds, family, slaves, retainers, transport themselves. Tents, furniture, and supplies, other than those of meat and milk, are packed on animals or loaded on carts. The tent cart of the steppes, the prototype of the Gypsy van, carries the women and children and the elders of the tribe. The life of a nomadic warrier is like in all respects to that of the nomad in peace, save that it has more dangers and more risks.

Each outburst was a gigantic caravan, increased from the usual grouping of some tens or some hundreds of related families, to a grouping of some thousands or some myriads. It set out for a longer journey, and it had no intent to return.

COIN OF VARDANES I.

The young men on horseback harried a wide belt of country, sending in food, cattle, slaves, and all movables of value. Captives were added to the fighting strength of the horde, and were driven to battle by the whip. If faithful and fearless, they were made free of the tribe by adoption and marriage. Subsistence, persistency in strength, wealth, the whole future, depended on present victory. The natural hierarchy of family, sept, and clan was readjusted into a proximately decimal military hierarchy with tithing-men, hundredors, chiliarchs, and myriad rulers for the several groups, corresponding very closely to sergeants, captains, colonels, and division generals of the present day. Each of these group leaders was appointed or approved by some superior. This simple and efficient organization marked the armies of Zenghis, was the foundation of the hussar (one per cent) ordinance of Hungary, and is the foundation of the Cossack system of recruitment of to-day.

Mithridates I.

A pastoral people, thus highly organized, incessantly overlooked and held responsible, highly trained in the use of sword and bow, of spear and mace, horsemen from the cradle, hunters from boyhood, hardened by their previous life of exposure into the physique of the American cowboy, the Mexican vaquero, or the South American gaucho, without communications to guard, carrying all the supplies which the day's plunder did not yield, hopeless, when encountered and resisted, save in victory, and withal capable of

Artabanus I.

speedy concentration on any given point of the circumference of its movable column, must have been, in an open country, save against firearms and fortifications, irresistible. However far it went it would preserve its military character. Whatever fragment it might throw off or leave behind would be like a garrison. At the place of final settlement it would be a compact, homogeneous colony, with recognized leaders and organization.

YUNG-LOH.
(From a Chinese print.)

Widely separated groups of Turanian people, each group compact, homogeneous, and national in character, mark the routes of these ancient excursions. Cossacks, Crimeans, the magian Medes, Parthians, have made great figures in the world. Sometimes the Tartar has been absorbed by the invaded nation. The Turk has been cross-bred into an inferior sort of Aryan. The Persian has acquired some Tartar characteristics, the Tartar element of Afghanistan has been slightly Aryanized. In India, Mogul and Mahratta have been absorbed, and a new illustration given of the proverb "Capua has taken Hannibal."

永樂木
YUNG-LOH

The character and aptitudes of the people of these sporadic colonies and of the steppe-folk have been carefully studied, and their genius is said to be agricultural, pastoral, and commercial. The best farmers, gardeners, drovers, shepherds, jockeys, and horse breeders of eastern Europe and of Asia, and their most faithful caravaneers, are of the Ugro-Altaic stock.

In religion, Tartar, Scythian, Hun, Turk, Mongol, Manchoo, Mahratta, seem to have had no primitive religion save ancestor worship and sorcery.

They practise the ceremonial and patronize the temples and priesthood of the state, and even of the popular religions, of the people whom they conquer, and sometimes have evinced a real enthusiasm for the prophetic and thaumaturgic pretensions of some indigenous cults. They have occasionally been vigorous persecutors of unpopular sects. Otherwise Lama and Buddha, Imaum and Pontiff, receive equal respect and meet with equal reverence. In a word, their tolerance has always been latitudinarian, except that it never favored, and often persecuted, a systematic intolerance of dissent, a proclaimed uncharitableness of opinion. The religion and

佛狼機
FU-LANG-KI.

theology of the Tartar has always been a part of the machine of government, and never a scheme of individual salvation.

COIN OF VARDANES II.

One intelligent, well-directed, and tolerably successful attempt to retain the Tartars as a ruling caste has been made in China, where two of the three nations of the eight banners of hereditary soldiers are Manchoos or Mongols, and nearly all the select, highly drilled, advantageously posted, and highly paid regulars are recruited from these two nations. A partial failure of the policy has been due largely to the Chinese dislike of the soldier, and to the relinquishment of a preponderant part of the civil administration to Chinese scholars trained only in literature, while the banner men have been examined mainly in gymnastics of mediæval war, and not at all till lately in the methods of modern military science. Still, as a special military caste, scattered through the country, always subject to call, all enrolled and attached to some provincial headquarters, which could readily be made a dépôt, they possess a formidable potentiality which, if embodied, armed, and properly led, has vast capacity for war.

TAMARLANE.
(After Sandon.)

The people of the steppes have produced many first-class generals. Attila, Zenghis, and Tamarlane have made the world ring with their conquests. Their subordinates must have been, in their positions, as competent as themselves to achieve the results reached.

KUBLAI KHAN.
(After Yale's reproduction of Chinese print.)

KUBLAI, THE GREAT MONGOL STATESMAN.

Just as K'ang-hi was the great statesman of the Manchoos, Kublai was the great Mongol statesman, and easily among the first of any age and every people.

Six hundred years ago, Marco Polo told to Europe the story of Kublai's

power, wealth, and magnificence, with many instances of his skill in kingcraft, of his adroit use of the iron hand in the velvet glove, of his skill in that essential practice of every ruler, the art of judicious neglect.

監鑄軍官
GIEN-GI GWEN-GWAN.

Kublai, at forty-six years of age, succeeded to the Mongol khanate and to the throne of northern China, in A.D. 1260. In A.D. 1264 he took the regnal title of Che-Yuan; in A.D. 1271 he named his dynasty "Yuan," and in A.D. 1279 he became Emperor, without competition, of the Sung as well as the Kin territory. He lived to be eighty years old, and died in A.D. 1294. He was the son of Tuli, the ablest of the sons of Zenghis, and the great emigrant chief had begun his successful invasion of northern China eight years before Kublai was born.

Thirty years of war, mostly in command of large armies engaged in subduing and governing a hostile territory, had fitted him for rule.

The Mongol organization, where each man belonged to a squad of ten, a century, a battalion of a thousand, and a banner of ten thousand, every group with a responsible chief, with duties to superiors and subordinates, was a competent machine for maintaining order, discipline, and efficiency, in the soldiers and their retinue, and for administering in their interests the territory invaded, its resources and population. He had seen that the conquerors were hundreds, and the conquered myriads. The general's art of providing a preponderant force on the day and at the place of battle was his, and he could strip an unassailed position to reinforce a critical point with excellent, if not infallible judgment. He had seen the empire of the Kins conquered in detail, and was engaged in subjugating the territory of the Sungs, province by province. No concentration could ever unite the power of China against the Mongol generals, while each of these always had all the others ready to respond to his call. He knew how the Chinaman loved local autonomy, and that marching to the aid of others seemed to him like deserting his own home. History had taught him that China had a tendency to disintegrate into several independent states and to change ruling houses. Tartars had ruled in northern China for two hundred years, and every part of the country north of the Yang-tsee-Kiang, and some territory south of it, had felt the Tartar sway during this period.

至元
CHE-YUAN.

Shun-Tsung and his great minister, Wang-Ngai-Shih, had miserably failed, two hundred years before, in an attempt to inspire a national spirit and to introduce universal military service and training. Kublai knew the needs of his dynasty, and appreciated the national character of the Chinese and of the Mongols, — one skilled in the arts of peace, an agriculturalist, a painstaking mechanic, a metallurgist, an alchemist, a lover of literature and philosophy, a skilful trader, respectful and patient, argumentative but not quarrelsome;

the other an expert athlete, an archer, a swordsman, a bold rider, a skilful drover, with no invention and no mechanic arts, without a literature or even a written language, obedient to the commands of his superiors, a disciplinarian without the argumentative faculty, or any sense of property save the power to take and hold. Kublai needed both these gentile forces for the strength of his empire.

Kublai, grandson of Zinghis, and First Emperor of Yuan Dynasty.

Theoretically the Emperor of China was an autocrat, the son of Heaven. Actually he had been an elector of ministers and magistrates out of a limited literary class, formed by a system of competitive examination before judges who were members of the same literary hierarchy. The conditions of admission and advancement in this literary class were, — proficiency in fine penmanship, — skill in the dialectics of a literary language which differed nearly as much from the colloquial dialects as the Italian spoken dialects differ from the written Latin of the poets and orators, — acquaintance with the ancient literature of China, — familiarity with the tropical sense of conventional phrases selected from it or referring to it, — knowledge of the moral philosophy of the Chinese sages, and of its application to jurisprudence and administration.

In this election the Emperor was assisted and almost trammelled by the bureaucracy. He promoted, translated, or degraded public officers upon the advice and report of inspectors and ministers belonging to the hierarchy. He sanctioned the edicts prepared by the ministers and agreed on by the various administrative boards. He performed the ceremonies prescribed to him by the Board of Rites, and gave the authority of his divine favor to the official calculations of the Board of Astronomy. By the customs of the empire he had less freedom of action than most of his subjects. Each province collected and administered its own revenue, and forwarded to the Imperial Court only the surplus, which was considerably abraded in transit. Each province was nearly autonomous.

前權營

TSENG-TUAN GWAN.

When Kublai began to exercise independent command, the provincial system was hardly better than anarchy. The exact sciences and industrial arts were inefficiently taught, studied, and practised. The calendar, the canals, and the roads of the empire were in disorder and unreliable.

He garrisoned the strong places with Mongols. He invited foreign talent to his court and made it useful. He reformed the calendar. He repaired canals and roads and opened new ones. He suppressed brigandage. He honored the memory of Confucius and conferred hereditary rank on his descendants. He patronized all the religions of his empire, — Buddhism, Taoism, Judaism, Lamaism, Islam, — and not only attended with reverence Christian worship, but protected Christian missionaries, and formally asked of the pope a detail of a hundred priests. He was a liberal patron of literature and men of letters, and gave them prominent positions as counsellors, recorders, and judges, but he kept the purse and the sword in the hands of Mongols, or of foreigners devoted to Yuan.

Under him the army was a truly national force, obedient to a central will, and serving within or without the empire as the chief of state might order. He met with defeat in Japan, and accepted the affront to his arms without attempting a revenge, which would certainly be costly, which was already unpopular, and which would clearly strain the resources of the nation. His wars in Burmah and Annam had vicissitudes, but resulted in a nominal conquest, and the payment of a considerable tribute to be spent among the Chinese. He contented himself with the full acknowledgment, by the distant Mongol conquerors, of his position of head of the family, and, exacting no homage, and granting no investiture, — by interchange of presents, and by cultivating matrimonial alliances, preserved during his lifetime a sympathy between the east, west, and south which seemed like an alliance for offence and defence, but which he was careful never to strain beyond the limits of an armed neutrality which threatened interference when neutrality was broken by others.

MARQUIS LAVAL MONTMORENCY.

By a slight change of the administrative system of China, he placed the resources of the empire more at the command of the Emperor than they had ever been. The comparatively small local subdivisions had, under the Sungs and Kins, been examined and reported upon to the central authorities by circuit inspectors. Kublai divided China into thirteen territorial divisions of comparatively homogeneous character respectively. He did not call them "paths," or circuits, but he gave them almost the same name as the national ministry. This last was called Chung-Shu-Shêng, and the province was called Chung-Shu-Hing-Shêng (central administrative-localized-supervision). The

"hing" of this phrase does not imply that the magistrate was ambulatory, and travelled circuit in performing his duty, but that he had travelled from the capital to exercise the central power locally. The Imperial authority was by this means always on the spot.

中書行省
CHUNG-SHU-HING SHENG

With the compact machinery of the Mongol nation, with the skill of western engineers, with the prowess of an exceptionally brave people fully trained to arms, Kublai, with nearly two thirds of China subdued and obedient, spent five years in the siege of Siang-Yang-Fu. During this siege, in the eleventh year of Che-Yuan (A.D. 1274), he established a department for the control of gunners. This fact, communicated to Secretary Bayard by Mr. Chang, the late Chinese minister at Washington, did not escape his critical research, although it had that of other scholars. On the fall of Siang-Yang-Fu, Kublai led his army into Che-Kiang, and sent his great general, Peh-yen, into Fokien. Six years more of war against three baby Sung emperors left Kublai undisputed monarch of all China. China, south of the Yang-tsee-Kiang, had been conquered province by province, and the whole power of the Tartar had always been concentrated against a provincial Chinese army, almost or quite unassisted by troops from beyond the borders. If twenty years of war had barely sufficed to subdue a nation which suffered itself to be beaten in detail, and could not evolve a national spirit, what could be done with China as compact, as disciplined, as the Mongols were? His own conquering armies might comprise two or three per cent of the population, not more. He could not breed a nation: he set out to educate one.

EMPEROR YEN-TSUNG-TI.
(Heliotype from a Chinese woodcut.)

He united the two great river systems by the great canal, a stupendous engineering conception unrivalled till our own day. The roads, the slack-water navigation, the bridges, were everywhere repaired and improved. Public granaries were established and the tribute corn was stored for times of dearth. The army was dispersed through the country, and small posts established a league apart on all the roads and canals. The soldiers served as couriers in the postal service, as signal men, as rural police, train and boat guards, and as cultivators of the military reservations. All the religious cults were favored, and aided with lands, buildings, and subsidies. Chinamen were patronized and put in office. Competitive examinations were con-

tinued, and the civil service lists of an expectant bureaucracy were still compiled. But always under Kublai the Mongol held the purse and sword. In 1284 came the invasion of Tonquin, and in this it is said by Abbé Grosier that the armies of China were repulsed by the use of Mahommedan cannon (*Hwei-hwei pao*). Dr. Edkins confirms this name. Mr. Chang has contributed another most important fact, hitherto overlooked, that in the twenty-second year of Che-Yuan (A.D. 1285) the artillery department was reorganized and given the name of Pen-Fu. It had an imposing personnel, a Ta-Su-Koh-Chi, a Wan-Hu, a vice Wan-Hu. At the same time the privy council for the management of military matters, was established, the officers of which were called Shu-Mih-Yuan, a title now obsolete in China for Chinese, but still employed as a Chinese equivalent for English privy councillors. These had two assessors or assistants called Tsien-Yuan. A character reading Shi, magistrate, could replace Yuan in these titles.

大書間士

TA-SU-KOH-SHI.

The title Wan-Hu means literally ten thousand families. It is evidently a Chinese equivalent for a Mongol chief of banner, or general of division. Morrison's Dictionary, which has been of great service in this inquiry, says that under the Yuan dynasty the Wan-Hu was an officer in charge of gendarmerie, and had the duties and held the rank of the Yih-Tsung-Ping, or lieutenant-general of gendarmerie, in the present Peking government.

Chu-Yuan-Chang, first Emperor of the MING Dynasty. Dynastic Title Hung Wu.

It was in the reign of Edward III. of England that gunpowder first appears in small quantity among government stores. Cannon-making was in Europe for many years a branch of the art of the copper and brass smith and of the iron forger. Service of artillery was the affair of guilds of gunners, who made their own powder, cast their own shot, and were a true trade's union, making contracts with potentates and city governments. Cities and towns armed their parapets with projectile engines at common charge, as well as built and manned them. Artillery was nationalized as a branch of the army by Louis XIV., and it was only in the first of the present century that the drivers of artillery became enlisted soldiers. Yet Kublai in China in the 13th century had recognized the need of this, and had nationalized the artillery of China.

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The first Kwei-Chow year after Kublai's establishment of the Pen-Fu office was 1313. Kublai's great-grandson, Jen-Tsung, then ruled China. In A.D. 1312–13, his regnal title was Hwang King. In A.D. 1314, and thence to 1321, his regnal title was Yen-Yew.

樞密院

SHU-MIH-YUAN.

The temple or posthumous title of Jen-Tsung, or Benevolent Prince, was given him by his Chinese subjects, in whose favor he relaxed some of the stern exclusiveness of the Mongol policy. He revised the civil-service lists, and sent many functionaries before the examining boards, and displaced or degraded those who failed. He did not permit substitute examinations or the purchase of certificates. He admitted Chinese as well as Mongols to places of power and of financial and military trust. He was the last truly prosperous Yuan emperor.

From A.D. 1321 to A.D. 1332, four emperors ruled under six regnal titles, no one of them long enough to establish a policy nor able enough to devise one, and Shunti came to the throne to reign under these regnal titles from A.D. 1333 to A.D. 1368.

The disintegration of the empire of Zenghis was complete before the reign of Jen-Tsung, who ruled nothing but Mongolia and China. Even the nominal family subordination of Kublai's cousins, shown by asking his assistance in the selection of a queen, became a thing of the past when Marco Polo delivered to Ghazan of Persia the bride selected by Kublai for Ghazan's father. The youth and vivacity of the bride at the outset of her two years' journey had discounted the maturity reached in the delay of the voyage, and he fulfilment by the son of the father's matrimonial engagement was grateful to both spouses, in spite of the incongruity which converted the virgin queen mother into a queen consort. Such a fortunate outcome depended too much on the good faith of ambassadors, on their difference in religion from their convoy, and on various delicate and uncontrollable events and circumstances, to bear repetition even among very near relatives.

皇慶

HWANG KING.

延祐

YEN-YEW.

It seems to have been thought, under Jen-Tsung, that a sort of federal system had been established in China and Mongolia which would assure the permanence of Yuan. The national territory was in full communication with its capital, the army was usefully and unobtrusively employed, local distresses were succored, justice was fairly well administered, the recruiting ground of the army in Mongolia seemed to be sufficient. The ambitions of the Tartars had been roused, their traditions of conquest, and the wealth brought home to the steppes by returning chieftains, caused discontent and envy in the mother swarm. The vigor of their warriors, their

polygamous habits, their harems recruited by tax, by the civility of vassals, and by conquest, caused a need of wealth and a continuous pressure of the population which, till Tamarlane led it in another direction, surged towards the Chinese wall.

仁宗

JEN-TSUNG.

Corea revolted, and the insurgents destroyed an army sent for its subjugation. The Yellow River burst its levees in A.D. 1342, destroyed the harvests on the loess, and so ruined the northern provinces that thirteen million people died of famine. Costly engineering works were devised and put in execution to protect the lowlands and preserve internal navigation, without which the plenty of the south would be useless to the hunger of the north. These works, under local administration and at provincial expense, were a crushing burden. Jen-Tsung's decentralizing policy was inadequate to evoke that grand sympathy between two peoples who had been hostile a half a century before, which would follow the call of suffering to-day in America or in Europe. The humanitarian, even the national spirit was lacking.

A literary civil service which resorted in sorrow to the stoical consolations of calligraphy and poetry, contained no spring of relief. The loss of registers, the ruin of family tombs, the destruction of record offices in department, prefecture, and district, had slackened or cast adrift the hierarchical control of magistracy over the people. Millions of masterless men thronged in the roads and fields, taking as brigands the subsistence which they could not earn as peasants. Disorder spread everywhere. The banner of revolt was set up, and order reappeared only as a sequel to successful rebellion, and in the name of its leader. In A.D. 1353, Kwoh-Tsee-Hing set up in Ng-an-hway as a self-proclaimed prince.

KWOH-TSEE-YING.
(From a Chinese print.)

His principal officer, and finally his son-in-law, was Chu-Yuen-Chang, bred as a Buddhist priest. He inherited the army of Prince Kwoh in 1355, captured Nanking in the same year, and proclaimed himself Duke of Wu.

Chu held the southern key of the canal system, and from Nanking as a headquarters, with a devotion to the cause of order and in the interest of a real nationality, he practised Kublai's policy and strategy in all the southern provinces. He furnished each with a magistracy, a rural police, and, where

needed, with a frontier guard; he suppressed brigandage; he saw to the employment of the people, to the collection of the tribute, and sent forward a large share of it to Peking. There is no record that he tolled it unduly, or that he was suspected of disloyalty. For twelve years the produce of the south tracked north on the canal, and the northern court was supplied. No adventurer was allowed to assume a higher title than Chu's, or to occupy a controlling territorial position.

元順帝

YUAN-SHUN-TI.

In A.D. 1363, Ch'en-Yew-Liang assumed the title of Prince of Hau, seized the gorges of the Yang-Tsee near Ngan-Kiang-Fu, holding them with a fleet on Poyang lake and on the river, thus throttling the commerce of the southwest third of China, and controlling half the provisions of the empire. In a series of naval engagements, relentlessly followed up till the insurgent army was destroyed and the insurgent prince drowned, this uprising was crushed.

In 1367, Chang-She-Ch'eng, who proclaimed himself prince of Wu, was attacked and overthrown, and Chu, having no rival, was persuaded by his generals to declare himself Emperor on New Year's day A.D. 1368.

His clutch at the sceptre was as vigorous as his preparation for it had been deliberate. His main column moved up the canal. He had in his train, water-borne in a vast fleet of boats, all the supplies which his energetic lieutenants in the southern provinces could collect and forward by a vigorous administration. A flanking column under Sotow moved through Houquang, and took control of the slack-water system of the Hoang-Ho. In four months the larder of Peking was in his hands. Shunti made one desperate spring with all his power at the main column and its supply fleet on the canal. He met defeat, and retired past Peking to Tartary, taking his court and ministry with him, where he died in 1370.

EMPRESS MA, DAUGHTER OF KWOH-TSEE-HING AND WIFE OF HUNG-WU.
(From a Chinese print.)

The Chinese annalists represent Shunti as humane and energetic. Europeans say he was debauched and indolent. He was undoubtedly a Lamaist, and maintained a considerable corps of divines, sorcerers, and Nautch girls. These were rather paraphernalia of state, and externals of the established church, than indices of personal character. On the other hand, his engineering works were grandly conceived and energetically pushed. He made gallant head against adverse fortune for years. It is represented by Chinese that his armies

were well supplied with firearms. He had yielded to attacks from without and disorders within the empire. His adversary had known how to combine the masterless men of the flooded lands and the restless spirits of the south into an army obedient to a single will, and had kept it footloose and free.

CHANG-SHE-CH'ENG.
(From a Chinese print.)

The new Emperor, henceforth known as Hung-Wu, had obtained his earliest authority in right of his wife, the Empress Ma, who died shortly after the expulsion of Shunti. Her adventures at the time of the Emperor's progress towards power were the theme of many legends. Hung-Wu (whose temple name is Tai-Tsu) won his early successes against bandits and casual levies, and his later against a disheartened and oft-beaten army, at the head of a trained and compact army, always encouraged by previous victory, always amply supplied with food, and in great operations, with the provincial divisions as reserves. The Peking forces had artillery, but the others probably had none. He had had little field fighting. His movement on Peking was an attack on the larder and baggage of Yuan, rather than on its forts and armies. His victory was strategic and not tactical.

During all the time from Kublai to Tai-Tsu there is nothing said of the Pen-Fu department, but the Yuan armies are said to have had artillery. On the fall of Yuan, the Mongol administration emigrated with the Emperor.

END OF BATTLE OF POYANG LAKE AND DEATH OF PRINCE OF HAU.
(From a Chinese print.)

So completely was the administration broken up that it took two years for the reconstruction of the empire. The provincial system was reconstituted on the improved plan adopted by the insurgents. Some of the Emperor's sons were made vassal kings over large territories. The tried and brilliant staff who had assisted the Emperor to power, and who had learned, in an active career of arms and adventures, to obey and to command, to appreciate and to execute a policy, who needed very little supervision to work in harmony with each other, could be trusted with authority only less than independency. In the new system the chief provincial officer was Ch'eng-Suan, Pu-Chêng-Shi, or Pu-Chêng-Shi-Zhe. In these phrases "Pu" seems to have the signification of deputation, "Shi" of civil magistracy, "Zhe

of ministerial rank, "Chêng" of initiation or direction, "Ch'eng" of travelling or distance from the capital, and "Suan" of inspection and reporting. The idea of this phrase may be given in English as "civil magistrate with the deputized authority of a minister of state for inspection, report, and regulation." This indicates extreme decentralization, and in later times attempts were made to bring the provinces into closer relations by appointments of Sun-Fu (emissaries to soothe the people) and Tsung-Tuh (controlling authorities), now called governors and governors-general.

市政使司
BU CHENG SHE SZE

Hung-Wu established his own court at Nan-King, and put his son Fo in authority at Peking as prince of Wen. All the old Kin empire reported to the northern capital, which had a full metropolitan administration.

The Kwei-Chow year of A.D. 1373 was after the expulsion of the Mongol. If any artillery department was continued, it was in the northern capital, and we next hear of artillery in the army of Prince Fo when he revolted against his nephew and marched against Nan-King in A.D. 1403.

From this time on it is conceded that Chinese artillery has existed, but it was made, or at least managed, by the Shên-Ki-Ying for a while, not by the Pên-Fu. The knowledge of how to make or use it came from the Peking division of the empire, which was where the Pên-Fu had been situated. The department which managed it in the revival was, curiously enough, of the same phonology as that of one of the Yuan artillery officers, and an officer of the same name is found in service in A.D. 1665.

明太祖

MING-TAI-TSU OR HUNG-WU.
(From a Chinese print.)

The only Kwei-Chow year in which the Pên-Fu artillery could have existed was A.D. 1313, and in this Kwei-Chow year alone for a half millenium was there an impending charge of regnal titles which, in the eighth month, might render an artist doubtful of the regnal title to inscribe. The regnal title of the Kwei-Chow guns was purposely omitted.

Until our argument is answered, the Fort Monroe swivel must be dated from September A.D. 1313.

Before placing in historical perspective this remarkable swivel, one peculiarity of the inscription should be noted which may or may not be a mark of antiquity. The characters on the gun of 1665 at Annapolis are traced in shallow excavation,

with free, elegant, and flowing curvatures, quite impossible to have been made, except with the hand-pushed chisel of the engraver, technically known as the "burin." The characters on the gun of 1680, although less free and flowing, still present the unmistakable features of burin work. Although the inscription on the Charlestown gun of 1607 has its characters very rudely and stiffly formed, yet they too were very probably made with a burin.

On the contrary, the characters on the Kwei-Chow guns were unmistakably made with chisels driven forcibly into the metal, probably without removing it. They are incised or die-sunk rather than engraved. They present very few curvatures, and those are but slight, and are angular rather than flowing.

CHEN-YEO-LIANG, PRINCE OF HAU'
(From a Chinese print.)

THE CHARLESTOWN IRON GUN.

At the Charlestown yard there is a wrought-iron gun from this same Corean capture, which was at one time labelled as made in A.D. 1370. Inspection does not disclose whether the barrel was butt-welded, lap-welded, wrap-welded like the United States three-inch ordnance gun, or forged solid and bored. The cavity for the breech-block was, however, unmistakably a half-round gutter, forged from a flat plate, and lap-welded to the barrel, and was then bound to it by a ring welded on over all. The trunnions are headed pegs inserted from within outwards through holes in a trunnion band which is shrunk on the outside of the barrel. One of them is loose. The butt is composed of a central iron fin, which has an enlarged forward end to which the rear of the breech-block gutter is welded, and the sides of the central fin are wooden side pieces fastened together through the central fin by pins and washers. It has no breech-block, and has been disabled by an overcharge. We owe to Bell, a traveller who accompanied the Russian embassy about two hundred years ago, upon the overland route, the knowledge that guns of this description could be seen in the Chinese armories along the great wall, so that it does not seem unfamiliar to a student.

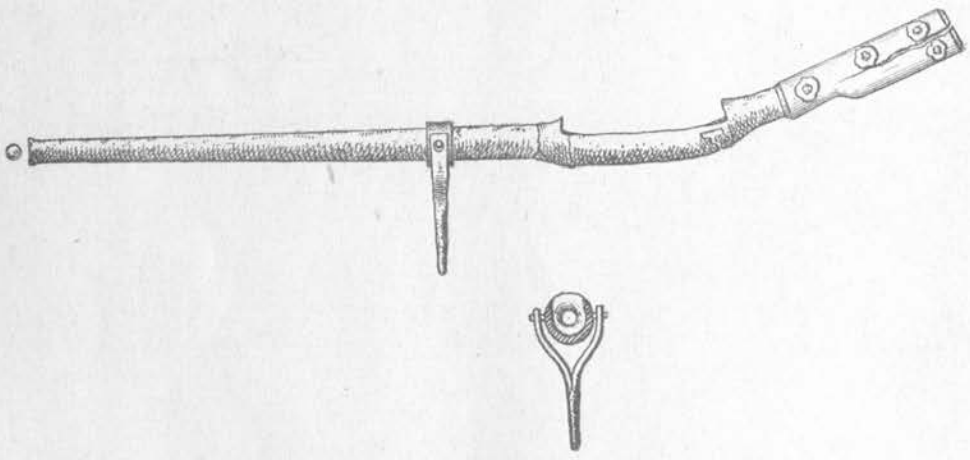
統制使

The gun is covered with a brilliant black patina, much like that on Russia sheet iron, but seemingly not entirely of iron oxide. It looks more like "black band" than like magnetite or specular ore. The surface has not been tooled since forging. The surface is raised into

ridges on the borders of the incisions of the inscription, and between the incisions is very irregular. A pencil rubbing on paper discloses many lines, marks, and ridges which are casualties of manufacture. The cut of the inscription is the result of very many rubbings, photographs, and drawings by several hands, and is believed to show all that time and corrosion has spared of the incisions, purposely made of a memorial character.

It seems to read, "Number thirty." The character for number is an unusual one. "Tzee-Tien," or "Lord of the Field," a name fit to be compared with that of the Mogul bombard at Benares, "Malik-y-My-dan," "Master of the field," "One hundred and forty-two catties." The character for "field" is badly made, and the reading is doubtful. So also with the character for "catties." The isolated character is "Kwan," "ordered."

The built and welded construction of this gun serves to explain the



THE WROUGHT-IRON GUN AT CHARLESTOWN.

hoops and mouldings of the cast guns, and it is introduced here partly for that, and partly to illustrate how the facts presented by the record have been rigidly adhered to in the foregoing argument. A date can be read out of the inscription by a trivial tampering of the sort called "editorial restoration."

The third character space is empty. Probably there was never anything there. If we assume an obliteration and try to fill it, we find that, by a few additional strokes in the characters reading "thirty" we can get the name "Tuli," father of Kublai, who was general for his brother for some years before and after A.D. 1254. We then assume that the character "Jen" of the Hia-Tsee (cycle of sixty) series is lost. Do a bit more of amendment lower down, and read, "Tuli-Khan, Jen-Tsee" "(A.D. 1252), catties one hundred and forty-two."

To be sure, the inscription does not say so now, but "restorationists" pity

the error of the inscription. Were there not another "restoration" equally fascinating, we might pause on this; but there is another yielding the date of A.D. 1353 to 1358, the regnal period of Kwoh-Tsee-Hing, father of the Empress Ma, and father-in-law of Hung-Wu. This involves inserting a character before Tsee as before, and amending one after it. It would read, "Number thirty Kwoh-Tsee-Hing one hundred and forty-two." The side character reading "Kwan" would date the piece about 1353, when he was a magistrate rather than when he was Prince of Chu-Yang.

SO-TOU.
(From a Chinese print.)

This, again, is playing with fire.

The iron gun, with our present knowledge, cannot be dated, but is undoubtedly old, because its inscription is chisel work.

The Kin, the Sung, and the Yuan dynasties had used artillery, and the Mings had risen on their ruins and dispensed with it, or used it sparingly until their neighbors employed it against them about the end of the 14th century. Then the resources and traditions of the empire quickly fitted out the Shên-Ki-Ying.

One cannot help thinking that the man Shên-Ki had something to do with this nomenclature. The nationalized artillery under the energetic Yung-Loh, who was a true nationalist in his army organization, served its purpose, and was kept as an imperial organization at the capital while the armies were made provincial and were localized, and for two hundred years allowed no artillery. Imperial economy and policy kept at the court the skeleton, — the unused workshops, and the workshop traditions of the artillery, making them of light consequence, — while provincial economy seldom aspired to add to the provincial expense. The Ming policy of China for the Chinese, and abstinence from conquest, rendered it of less importance than in Europe, and the occupation of Europeans at home for two hundred years prevented a pressure from without from compelling a study of the art.

A devotion to field sports might have induced the study. But the Chinese

lack this. A redundant population, seeking always mere bread, offered always recruits enough, willing to earn their rice in brutal hand-to-hand struggles; vacancies in the ranks could be filled by the myriad. There was no demand for economy of life in order to cause the development of the telebleptic and engineering arts, so much resorted to by Dutch and Swiss. Incursions of barbarians, or faction fights in the provinces, required no superiority of weapons to compensate for inferiority of force, and to give one side a preponderance of power with less numbers, by increasing the space over which the superior force would be in peril.

地雷王子[illegible]壹百四十二 貫

The Tvzr "Restoration" AD 1254

Thus, while Tsung-Cheng-Ti, the last Ming emperor, had, when his suicide practically ended his dynasty, six thousand enunchs as seraglio guards, it is probably true that he could not have found in all his army, gunners enough, nor in all his arsenals ammunition enough, for a single day's work with the Fulang-kis of his forts and armories.

Indeed, the artillery revival in the reign Kang-Hi was superficial and ineffective. About a hundred years later than the time of Schaal and Verbiest, the English Macartney mission went to China. Mr. Burrow, who accompanied it, states that at that time the soldier made his own powder, purchasing the materials himself, and paying no attention to the purity of the nitre. The powder was not granulated, and often spoiled from atmospheric causes. The formula was half nitre, and quarter each of sulphur and charcoal. This would be slow-burning, dirty, and weak, hardly more than a mere rocket composition. Good powder contains about twice as much charcoal as sulphur, and a very little more than three times as much nitre as the charcoal and sulphur together. Here we have a key to the inefficiency of Chinese firearms and to their excessive calibres and weights,—bad powder. This weakness of powder is betrayed by the weakness of the key for holding in place the breech-block of the Fulang-kis.

地三十郭子典壹百四十二 貫

The Kwoh-Tsze-Hing "Restoration" AD 1353–1378

From this marshalling of facts, derived from a painstaking search of the

history of a remote and obscure period, concealed in a difficult and little-known language, complicated with questions of foreign and curious literary

Double barrel Magazine Gun Reign Wan-Lik, AD 1607. At Navy Yard Charlestown - Mass. Corean capture of Lieut. Rogers.

etiquette, of ancient misconceptions of characteristic ethnic forms of thought, in which the nature of the error is proof of its origin and a means of its correction, where we have had to consider the tools for inscribing as well as the characters of the inscriptions, we have returned to the result modestly announced in A.D. 1886 by Mr. Chang-Yin-Hoon, the late minister at Washington, that the Fort Monroe Fulan-ki dates from the Kwei-Chow year, second of Hwang-King, A.D. 1313, and is the oldest gun of the world.

It is five years senior to the trunnionless Amberg bombard. It is a hundred and seventy-seven years older than the Bartemy du Pin gun of the Paris museum, the oldest trunnioned gun of France, and it is a hundred and sixty-years, at least, older than the cast-iron trunnioned gun of Charles the Bold at Neustadt.

This result was so startling when first announced, and so worthy of research, that the investigation was begun and has been developed into the discursive argument presented. For this no excuse is presented, and but one hope, that it has not proved tedious.