LATTER DAY WEAPONS

Destructive Power of the Modern Rifle—Its Effect Upon Battle Tactics.

The Mauser of the Spaniards Superior to Several of the American Arms.

(Chicago Times-Herald.)

The weapons with which the next war will be fought are as much an improvement over the weapons with which Napoleon's legions were armed as Napoleon's weapons were an improvement over the muskets of the men who fought at Minden. Indeed, if Napoleon were alive to-day it is certain that there would be little opportunity for the exercise of his remarkable tactical genius. The battlefield of old was small and one man could easily overlook it. The battlefields of the future will cover miles upon miles of territory, and the general commanding will direct the movements of his many corps from some house faintly within hearing distance of the big guns. The field of Waterloo is singularly disappointing in respect of size to one who views it with preconceived modern notions, but no such complaint will be entered against the next scene of death's struggle between the armies of civilized nations. More men will be engaged and their guns will shoot farther. That makes the difference.

As in the development of modern powders, so in the development of the modern rifle, the Germans have led. It was Prof. Hebler, of Berlin, who first showed that the .45 calibre was about one-third too large, and that a cylinder reduced to a calibre of .30 with a very rapid twist, would give the best results. This reduction has lessened the weight of the bullet by one-half and increased its velocity by 30 per cent. The velocity has been further increased by the change of powders. The soldier is now able to carry with him double the old supply of ammunition. The substitution of the material called "cordite" for the compressed powder which now obtains in the British service has further increased its offensiveness, until he is by far the most dangerous animal that walks.

Practically all of the small arms with which the troops of the nations are furnished are magazine guns. Their adoption was delayed by the doctrinaries, who declared that a soldier with a magazine gun in the stress of battle and excited to frenzy by conflict would waste more ammunition than he was worth. The same argument was advanced against the adoption of the breech-loader many years ago. It was proved fallacious in the latter case. The belief among military men is that it will prove fallacious against the magazine arm. There seems to be little difference in the value of the various modern military rifles. Each has some minor point of advantage. Each has some minor defect. The improved arm of the Germans, the Mannlicher of the Austrians, the Lee-Metford of the British, the Lebel of the French, the Mauser of the Spanish and the Krag-Jorgensen and Lee of the United States, have about the same zone of fire, are practically of the same calibre, and are universally deadly. The difference between the nickel-jacketed bullet, the steel-hardened bullet and the German-silver bullet, by which the soldiers of Wilhelm swear, is largely one of imagination. They will all kill at tremendous ranges. Perhaps the best general results are given by the nickeled projectile whose penetrative powers are simply phenomenal.

In the long peace that has brooded over the world the limit of improvement in military small arms would appear to have been reached. It remains now to try them on living human bodies instead of upon cadavers, which cannot shoot back. In scientific parlance, "We have reached an equation in the proportions of mass in the rifle and the projectile, in calibre, rifling and twist, in the sectional density of the bullet and in the power of the explosives. Beyond this any possible improvement would be ineffective for the reason that to exceed the present limits would be to exceed the muscular and visional power of men."

The modern arm, when rifled on the Metfrod plan, has seven grooves on the interior of the barrel which go three times round the barrel in its length of thirty inches. The rifling is made thus severe in order to steady the missile in its long flight. The weapon is sighted up to 3,500 yards and its point blank range is a minimum of 300 yards. In action the sights will not be altered up to 1,000 yards. English compressed powder gives a muzzle velocity of 1,600 feet per second. From cordite a muzzle velocity of 2,250 feet per second is obtained. At 1,000 yards the mean deviation of the bullet from the Springfield rifle is 21.4 inches. The deviation of the high-powder, small calibre bullet is less than twelve inches. From the modern arm forty shots a minute may be fired if the soldier has a spare magazine ready for adjustment. If a man stands near him with more than one magazine a speed of sixty shots a minute can be made. This, of course, is firing without aiming. The Mauser rifle, to which the United States troops will be opposed in case of war with Spain, is immeasurably superior to the old Springfield—superior, in fact, to any gun we have save the Lee and the Kragg-Jorgensen. Its rapidity, long range, accuracy, and low trajectory have more than doubled the danger spaces up to a mile, and it is exceedingly disagreeable even beyond that distance. The general penetration of the nickle-jacketed bullet may be stated at 9-10 of an inch of steel, 3½ inches of oak and 3 inches of beech. Singularly enough, it has been demonstrated that the best defence against it is loose sand, and attacking parties of the future will throw up miniature embankments in front of each squad. This can be done readily and rapidly with the bayonet. The lead-pencil bullet penetrates some fifteen inches of sand and is then battered out of all resemblance to its original self. Much has been said of its inability to produce sufficient shock, and there is no doubt that its paralyzing capacity is much less than that of the .45 calibre missile, but it may be said that any man struck with it will be put out of the fight, and in military formula a man hors de combat is a man dead.

The effect of modern magazine small arms in combats between large forces is, of course, problematical. Military writers, however, are pretty well agreed that these effects will be unprecedentedly serious. The next war will be approached by the opposing parties with a feeling of curiosity tempered by grave apprehension. Between troops equally numerous and equally disciplined the encounter will settle once and for all the tactics of the future. Many cobwebs will be brushed from the brains of theorists. Also many men will be killed. Upon this subject Captain William E. Dougherty, of the United States army, has written much and well. He says: "When the potential forces that are now available for warfare are directed on the battlefield of the future with intelligence and skill the devastation that will be wrought upon the area covered by the conflict and its environment will surpass anything of the kind known in former wars. Conditions and necessities now unknown and inconceivable will press upon the victor and the vanquished alike. The number of wounded will exceed enormously that of any war heretofore, and the noncombatant auxiliaries, hitherto safe in any shelter behind the close formations, will be compelled to contribute their quota to the mortality and casualty list or abandon their sphere of action, for the penetration of the steel and nickel-clad missile is so great that, outside the fortified positions on the field, there will be no place of safety within a mile of the battle front."

WAR NOVELTIES ON TRIAL.

New Ideas Brought Out by Exigencies of the Times.

A general rule arrived at is that the modern steel gun should not be fired more than 100 times. After that, it matters not what the emergency may be, it is safer to dismantle the gun and send it back to the shop than to risk firing it, for the explosion of a gun is a decidedly dangerous occurrence to all in its immediate locality. The firing of a gun causes the steel to crystallize and thereby becomes as brittle as a file.

The United States will employ a light artillery of breech-loading guns of 3.2 calibre. These are the most efficient cannon for field purposes constructed up to date. They can deliver projectiles with a muzzle velocity of a quarter of a mile a second. The projectile employed are usually shrapnels, each one bursting being resolved into about 300 fragments. The flying fragments form a cone 500 yards long, and when one of these missiles explodes in front of an advancing enemy the damage is widely distributed. But no matter where the enemy is, whether behind hills or breastworks, the artilleryman has only to get his elevation and he can drop the shrapnel where he likes. This sort of shell is exploded by a time fuse.

Five companies of fifty wheelmen each have been organized in Indiana and have asked for enlistment as a distinct corps, but their applications have been simply filed by the war department. Cyclists armed with magazine guns and accompanied by rapid-fire guns on tricycles could move more rapidly on good roads than a body of cavalry and are especially adapted to a swift, silent advance and a surprise, but the conditions in Cuba are not favorable to the experiment.

One of the ideas offered by inventors to the Washington authorities is to build tanks to contain crude petroleum at convenient places near the entrances of exposed harbors so that the surface of the water may be flooded with oil in a few minutes when warning is given of the approach of the fleet of the enemy. Then with rockets this oil may be set on fire in various places and offer a barrier of flame which the invader cannot cross without inviting his own destruction.

STIKINE TO TESLIN.

One of the Two Bridges Has Already Been Completed—Work on the Trail.

Mr. J. H. McGregor, provincial land surveyor, has returned from Teslin Lake, where he spent the winter doing work for the provincial government. He went North last fall, being one of the first to pass up the Stikine on the ice. After plotting townsites at Telegraph Creek and Glenora for the government, he proceeded to Teslin Lake, and dragging his own sleigh made the trip in nine days. Here another townsite was laid out for the government.

About five hundred men, Mr. McGregor says, had reached Teslin Lake when he left and some of them had proceeded to several small streams emptying into the lake, in which the Indians reported that there was gold. Along the trail a number of men are waiting for the snow to disappear from the summits, while a thousand men are at Telegraph and Glenora and another thousand, who started up on the ice, are on the banks of the river waiting to be picked up by steamers.

Besides plotting townsites Mr. McGregor was instructed to pick out the best route for a road. On the trail used last year he says, a lot of corduroying would be necessary, but from what he could see while passing over the route, he is of opinion that to a large extent this expensive work can be avoided by taking to the side hills. Only two bridges are necessary, and one of these has already been completed and the other is under way.

Mr. McGregor says the men on their way to the Yukon will not be delayed for the want of a trail. Although most of the snow has disappeared the ground is still frozen and before it softens the government road will be ready. Mr. McGregor returns North in a few days to do the survey work for the road.

Hector McLean, a brother of the McLean brothers, who were hung at Kamloops in the seventies, has been sentenced to three years at Telegraph for a murderous assault on an Indian, beating his victim on the head. This is McLean's second offense of a similar nature since he went up the Stikine.

ADVERTISING VICTORIA.

Mr. Davis Returns Home After Extensive Travels in This City's Interests.

Mr. Edwin Davis, who left this city six months ago under the auspices of the Board of Trade, on a tour through the Australian colonies for the purpose of advertising Victoria as an outfitting point, was among the arrivals on the steamer Aorangi arriving from the South a few days ago. All the leading cities and mining centres in the Australian colonies as also in Fiji and New Zealand were visited and maps and literature freely distributed. Hundreds of interviews were given, the press devoting much space to what he had to say about the northern gold fields and Victoria as a point for outfitting.

During the last few months the Board of Trade have been receiving copies of these papers and many more of recent date were brought by Mr. Davis on the Aorangi. Should the reports of this spring's "clean-up" prove to be one-quarter of what is now anticipated, Mr. Davis states there will be quite an exodus from Western and South Australia and New Zealand, but just now the enthusiasm over the gold discovered has partially abated owing to entire absence of news for the past four months. Many syndicates are being formed for the purpose of sending practical miners to the gold fields. The Australian ideas of where these are are really amusing, some entertaining the belief that it is necessary to go to Vancouver and from there take the train to Teslin Lake. Others have heard that a line of coaches are running between Vancouver and the White Pass.

Mr. Davis says "that Victoria is heavily handicapped by the shipping companies, their tickets reading from Melbourne or Sydney to Vancouver, Victoria not being mentioned. This works in a peculiar way. Miners will come in to coast cities and will get their banking orders to read the same as their ticket. Consequently when they embark and are talked into coming to Victoria, the first thing they think of is the possibility of having the orders cashed." Mr. Davis said he made arrangements with the lines running to San Francisco to charge passengers to Victoria the same rates as passengers to the Bay City were charged.

There is a splendid market in Australia, Mr. Davis says, for frozen salmon and he observed while there that all shipments from England met with very rapid sale, even at 36 cents, the price obtained.

At Broken Hill Mr. Davis was presented with a box of specimens from the famous Proprietary mines for the Board of Trade, consisting of pure native silver, kaolin, carbonates of lead, zinc and green chlorides.

GETTING READY.

Preliminary Meeting to Arrange for the Campaign in the Government Interests.

Now that the session of the legislature is over the preliminary steps toward organizing for the coming general elections were taken at a meeting of supporters of the present provincial government held last night at the rooms, corner of Broad and Fort streets. Preliminary arrangements were made and after the business of the evening was disposed of short addresses on the questions of the day were given by Premier Turner, Hon. C. E. Pooley, Q.C., Hon. D. M. Eberts, Q.C., Messrs. H. Dallas Helmcken, Q.C., M.P.P., and Wm. Adams, M.P.P.

In the course of his remarks the Premier said that he had been invited to deliver addresses in many portions of the province between now and election day, and though he would do his best to visit as many places as possible he feared that he might not be able to find the time at his disopsal to meet every request.

MRS. BLADON TALKS.

She Never Knew any Remedy to Equal Dodd's Kidney Pills.

Her Experience Has Been with Hundreds of Cases and She Never Knew Dodd's Kidney Pills to Fail in One.

St. Thomas, May 20.—Hospital nurses and physicians never speak in favour of any medicine unless it is one that can confidently be depended upon to do just exactly what it is claimed it will. Under these circumstances, the following letter, written by Mrs. J. Bladon, No 9 Inkerman Street, St. Thomas, a popular and successful professional nurse, has aroused the genuine interest of the people of this town.

Coming, as it does, at a time when the town is talking of several almost miraculous recoveries from supposedly fatal attacks of Kidney Disease, through the use of Dodd's Kidney Pills, the letter is of fore than usual weight and importance.

Mrs. Bladon says: "I have been nurse in the Railroad Hospital in St. Thomas for five years, and during that time have come into contact with many railroad men who were suffering from Kidney Diseases. They and other patients under my care, have, to my personal knowledge, used Dodd's Kidney Pills for Kidney Diseases, and Urinary Troubles. Ladies, who have been in my care have used these pills for female complaints, and in every one of these cases, a complete and permanent cure was effected by these wonderful pills.

"As a professional nurse I can do and do say I have never known and other medicine that could equal Dodd's Kidney Pills for the cure of all Kidney Diseases.—Mrs. J. BLADON."

Dodd's Kidney Pills are sold by all druggists at fifty cents a box, six boxes $2.50, or sent, on receipt of price, by The Dodds Medicine Co., Limited, Toronto.

A MONTE CRISTO BOOM.

Prospect of Early Shipments Makes Rossland Stockholders Very Happy.

Rossland, May 20.—The announcement yesterday that the Monte Cristo would at once join the list of steady shipping mines sent the stock of that company into even heavier demand than ever, and it rose steadily in price, although there was very little actual dealings, as holders generally anticipate a further sharp rise, and decline to let go their scrip at even the figures offered yesterday. Some brokers are demanding 25 for the stock and decline to let it go at any lower figure, for they say they look for it to bring that figure within a very few days.

At the mine arrangements are under way to commence shipping on the date set, the 25th of the month, and pipes for supplying air to the drills to be used in breaking down ore are being installed. Two machines will bet set to work in the slopes and they should have not the slightest difficulty in breaking 50 tons daily as they would be in continuous operation day and night. This alone will demand an addition of at least 25 men to the force at the mine, which already numbers nearly 40 men.

While it is only given out that shipping will amount to 50 tons daily, yet it is thought it will not be long before one hundred tons will be the figure. Said a mining man yesterday who is intimately acquainted with the condition of the company's affairs: "As you may remember, when Vice-President Shaughnessy of the C.P.R. was here last fall it transpired that the mine was then in condition to ship one hundred tons daily, and as since then development has been going on quietly with a force of about forty men, largely engaged in blocking out ore, the mine certainly should have no trouble in surpassing even the hundred-ton mark if it should be so decided by the officers.

"It is stated that ore will give an average profit of at least $10 per ton, so that supposing 50 tons daily is shipped it will net the company $180,000 annually, which if distributed would give shareholders a trifle less than 8 cents per share the first year. There may be better buys right now than Monte Cristo, but I don't know what they are."

United States Consul Smith, of Moscow, reports that a telegram from Tomsk announces the finding of a gold nugget weighing seventy pounds in the Spasso Preobrajenck mines, situated on the River Chibyek, in the district of Yenesi. The nugget, says the consul, will be found to take the eleventh place, as far as size is concerned, among the nuggets of the whole world, and the second among those found in Russia. The first was found in the South Oural mountains.

What Dr. A. E. Salter Says.

Buffalo, Y.Y.—Gents:—From my personal knowledge, gained in observing the effect of your Shiloh's Cure in cases of advanced Consumption, I am prepared to say it is the most remarkable Remedy that has ever been brought to my attention. It has certainly saved many from Consumption. Sold by Cyrus H. Bowes.

REVIVAL OF MASONRY ARCHES.

(The Engineer.)

Before the advent of structural iron and steel the masonry arch was practically the only permanent form of construction suitable for spanning considerable openings, but the introduction of trusses, girders and braced metallic arches in great measure superseded the stone of brick arch until very recently.

There seems, however, now to be a revival in the use of the masonry arch, partly because of a desire for something more massive and durable than any metallic structure, and partly because the development of improved methods of computation and design have rendered satisfactory proportions more readily attainable than was formerly the case, when empirical methods were the rule. It is true that the largest stone arch in existence, the Cabin John Aqueduct arch of Gen. Meigs, was constructed before the modern theory of the equilibrium were fully developed; but at the same time the conditions under which the Cabin John arch is used, with its constant and stationary load, permit a successful construction, where for railway service, for example, quite different proportions would be required.

Since the investigations of the Austrian Society of Engineers and Architects, however, and the development of the graphic and elastic theories, engineers have grown bolder and more confident, and the result is apparent in several notable cases. One of the most notable cases in point is the fi neseries of large stone arches over the River Pruth, on the line of the Stanislau-Woronienka railway, this including one arch of over 212 feet span and one of 157 feet, both designed by Chief Engineer Ludwig Huss, and both proportioned upon the theories developed from the result of the tests made upon the large arches of the Austrian Society's Commission.

Another very interesting arch is that now under construction over the River Aar at Berne, in Switzerland, this being especially noteworthy from the fact that the conventional circular and elliptical curves have been entirely abandoned, and the correct method of making the arch ring of the exact shape of the equilibrium curve adopted. This arch is also interesting from the fact that its rise is great as compared with the span, the latter being 197 feet and the former 115 feet, and the graceful catenarian curve will undoubtedly add much more to the beauty of the "Lorraine" bridge, as the new structure is to be called.

This bridge is an excellent demonstration of the renewed interest in masonry arches, since the design adopted was selected from a number in a competition which included various forms and materials, and was the only entirely stone structure entered in the competition.

The Duke of Orleans has just purchased from Mortimer Singer, of sewing machine fame, his 800-ton yacht, Roxana, which used formerly to belong to the Duke of Leuchtenberg. Being accustomed to travel everywhere by special train on land, the Duke has come to the conclusion that it is beneath his dignity to journey by passenger steamer whenever he goes to Spain, where he has large estates near Seville, or to visit his sister, the Queen or Portugal, at Lisbon, as he cannot go through France he must necessarily go to Spain by sea.

The Prince of Naples has begun an experiment in the education of the troops under his command. He is having all the privates in the garrison at Naples taught scientific farming. He thinks that in this way he can overcome the dislike for agriculture, all the soldiers, even those recruited from farming districts, show when discharged. This dislike is attributed to the fact that all soldiers in the army must learn to read and write, and when they come out they feel themselves too good for farming and join the ranks of the social discontents.

WAR AND MODERN SURGERY.

Development in Surgery Compared With That in Guns.

(Medical Record.)

It is quite likely that during the progress of the present war there will be entirely new experiences in the character and treatment of the wounds inflicted in battle as compared with those of thirty years ago. Since that time the destructive machinery of the battlefield has been brought to such a degree of perfection in regard to distance of range, accuracy of aim, and power of penetration, that the percentage of such as may receive slight wounds, from which recovery may be possible, will be exceedingly small in proportion to such as are destined to be killed outright. It will be a question of wholesale slaughter, in which the winner can show the greatest amount of annihilation in the shortest possible time. The mill that has the best grinding-power will be the first to receive the prize. The game is to be played with stakes in job lots. It is to be a wholesale business entirely, the mere retail exhibitions of personal bravery, individual tact, or military genius being virtually unnecessary for the desired end. The best-equipped machine shop will turn out the most goods. Hence it will be impossible to etsimate the amount of damage that may be done, or the number of lives that may be sacrificed. The wounds will be on a large scale and numerous in proportion. Especially will this be the case on the battleships under fire. Extensive lacerations from exploding shells, submarine mines and torpedoes and splinters of steel and wood will be the rule. The wide areas of tissue involved and the corresponding intensity of shock will necessitate new rules for operative interference and new methods of technique. Comparatively speaking, amuptation will be more necessary than resection.

When once the danger of operation itself is past, aseptic surgery will abundantly demonstrate its opportunities. What is lost in one direction will be gained in another. Hospital gangrene, the dreadful bane of wound treatment in our late war, will be virtually impossible, and suppurating stumps will no longer propagate their poisonous influences. Intestinal surgery has also elevated itself almost to a science, and death on the field, virtually inevitable before, is now most effectually thwarted by the modern and ingeniously skilful methods of the present day. Thus, while the war may inflict larger and more dangerous wounds than ever before, there is a comfort in contemplating the compensatory balance of odds in favor of the corresponding advances in operative methods and the improved technique of wound treatment.

The experiences along the new lines of surgical procedure will be of the greatest interest to the profession in demonstrating on a large scale the value of those general principles upon which the recent surgical advances have been based.

GREAT DOGS OF WAR.

The Huge Projectiles Which May be Thrown Many Miles From Modern Battleships.

(Chicago Inter Ocean.)

That a modern battle between modern fleets, armed with modern guns, will be a terribly destructive one, both to the ships and to the lives of those who man them, is conceded by all naval authorities. The destructiveness will come not only from the tremendous power and effectiveness of the guns, but also from the fact that the shell has replaced the solid shot in all calibres down to the one-ponder, so that to the penetrative effect of the projectile is added its explosive power and the scattering of its fragments in a destructive and death-dealing circle many feet in diameter.

Shell fire in warfare has always been a terrible thing, but now that the penetrative effect of the solid shot has been supplemented by the explosive effect of the shell, one may well wonder as to what will be the fatal result.

The modern armor-piercing shell, made of hardened steel, and with its conical point carefully fashioned for the greatest penetrating power, has all the armor-piercing effectiveness of a solid shot of the same shape, while its explosiveness makes it indfinitely more destructive. For the modern shell does not explode when it first strikes the side of the armor of an enemy's ship, but after it has pierced the side or armor or exhausted its penetrative effect. The percussion fuse is in the base of the shell, and is exploded by a plunger driven against it by the force of the impact of the shell on striking. The time between the impact and its explosion is sufficient for it to have done its full penetrative work.

An extended discussion of guns versus armor, however, is a subject which must be handled chiefly with technical phrases. It is the intention of this article to give concisely some facts and figures as to the guns carried by the ships of Uncle Sam's navy, the projectiles which they throw, their power of penetration, and their effective range.

It must be understood that all modern guns on ships-of-war are breech-loading and rifled, and that the smooth bore exists only as a relic, or to be brought out in an emergency for coast defense, when modern guns are not available. From the thirteen-inch down to the four-inch, the guns are designated by their calibre, the diameter of their bore, and the shot they throw, while from that to the one-pounder they take their name from the weigh tof the shot. Everything below the one-pounder is in the machine-gun class.

The base of rapid-fire work is the bringing together in one cartridge of the primer, powder and shell. When the limit of weight of cartridge, easily handled by one man, is reached, the limit of rapid-fire action is also reached; and, although the quick-moving breech mechanisms have been applied abroad to guns of as large as eight-inch calibre, such guns would rank as quick, rather than rapid-firing, and would require powder and shot to be loaded separately.

On the modern battleships the functions of the great guns is the penetration of the enemy's armor, either at the water-line belt or on the turrets and gun positions, while that of the rapid-firers is the destruction of the unarmored parts or the disabling of the guns not armor protected. The six, three and one-pounders direct their rain of shots at the turret portholes, gun shields or unprotected parts of the ship, having also an eye to topedo boats, while from the fighting tops the Gatlings rained a thousand shots a minute on any of the crew in exposed positions. With such a storm of large and small projectiles it would seem to be rather a question of who would be left alive rather than who would be killed.

The guns in use in the United States navy are the 13-inch, 12-inch, 10-inch, 8-inch, 6-inch, 5-inch, 4-inch, 6-pounders, 3-pounders, 1-pounder, Hotchkiss 37 mm, revolver cannon, and the machine guns. In the following table is given the length and weight of these guns, as well as of the shell they carry:

Guns.	Length of gun, feet.	Powder charge, pounds.	Weight of shell, pounds.
One-pounder	5.1	.3	1
Three-pounder	7.3	1.7	3
Six-pounder	8.9	3.0	6
Fourteen-pounder	11.6	8.0	14
Four-inch	15.7	14.0	33
Five-inch	17.4	30.0	50
Six-inch	21.3	50.0	100
Eight-inch	28.7	115.0	250
Ten-inch	31.2	240.0	500
Twelve-inch	36.8	425.0	850
Thirteen-inch	40.0	550.0	1,100

The 14-ponder, although not included in the navy armament, is given for the purpose of comparison, since it is with guns of this calibre that some of the Spanish torpedo boat destroyers are armed. The largest gun as yet mounted on our largest torpedo boats is the 6-pounder, while a single 1-pounder is the gun armament of the ordinray torpedo boat. The Hotchkiss revolver cannon is not given in the table, because its calibre, etc., is the same as that of the 1-pounder, and, in fact, the latter has superseded it in the latest armaments, so that it is now found only on the older ships of the modern fleet. The machine guns are not given because their effective work is practically the same. The Gatling is of 45-calibre, and uses the government ammunition for the Springfield rifle.

A look over the table shows some general principles in the matter of powder and shell used. The powder charge is about half the weight of the shell, while the length of the shell is a little over three times its diameter.

To attain its extreme range a gun must be given an elevation of about fifteen degrees. The greatest elevation given any of the guns on shipboard is about six degrees. This limit is made by two factors—the size of the portholes or opening in the turrets for the larger guns, and the danger of driving the gun backward and downward through the deck by any greater elevation. The practical range of the great guns of a ship, the ten, twelve and thirteen-inch, is not, therefore, believed to be over five or six miles, and even at that range the chances of hitting a given object would be very small. A city could, of course, be bombarded with effect at such a range, since a shell would do tremendous damage wherever it might strike, but a city to which a ship could approach no nearer than say seven miles would be safe from bombardment.

The muzzle velocities given the shells from the guns of the navy are something tremendous, while the muzzle energy is simply appalling. The shell from the thirteen-inch guns leaves the muzzle at avelocity of 2,100 feet a second, and with an energy of 33,627-foot tons, or the power required to lift one ton one foot. From this velocity the range is to 1,800 feet a second in the on-pounder, although from the three-pounder at 2,050 feet it averages about the same as the thirteen-inch. The five-inch rapid-fire gun has the greatest muzzle velocity at 2,250 feet. The muzzle energy is, of course, small in the smaller guns, being only twenty-five-foot tons in th one-pounder and 500 tons in the fourteen-pounder.

The power of penetration has already been given in a general way, but the power of penetration of steel is much greater. At its muzzle velocity the thirteen-inch shell will penetrate 26.66 inches of steel, the twelve-inch 24.16 inches, the ten-inch 20 inches and the five-inch 9 inches. The one-pounder shell bursts in piercing one-fourth and nine-sixteenths-inch plates, scattering its fragments behind the target.

Although not strictly pertinent to the story, it may be interesting to not that the cost of one discharge of a thirteen-inch gun is $800, and that when a battleship like the Massachuetts lets loose her entire battery, both main and secondary, the cost of a single discharge is $6,000.

THE DEBT OF CUBA.

Neither Spain Nor Cuba Can Pay It; Who Will?

At the end of the year 1897 the debt of Cuba was $522,020,200, and the capacity of the island to raise revenue is limited to $35,000,000 or $40,000,000 a year. The debt appears to have been chiefly created in the last twenty years, the total debt in 1868 having been only $20,000,000. Since 1866 the increase of the debt has been abnormal and ought to have created alarm. Recently the question has been in Cuba, by whom ought this debt to be paid?

Senor Moret expressed the opinion that Spain ought to pay part of it; some Spaniards thought that Spain, in whose cause the debt had been contracted, ought to pay the whole. What will happen, if, as is probable, Spain, by the fortune of war, should lose the island? Who will then pay the debt? Or will it be repudiated? In 1863, the Spanish minister, de Ultramar, decided that the debt of Cuba ought to be diminished, and in that year, by him, a reduction of $7,386,466 was made. Every year since 1873 has seen a deficit.

The American government, under Polk offered $100,000,000 for the island, and $120,000,000 was the limit which he was willing to give. Spain refused to sell then, as she would now. Persons who have recently raised the question of a purchase, as the alternative of war, have not named a higher sum than $200,000,000, not much more than one-third the amount of the debt. If Spain be ousted from the island, she may be unable to pay the debt; and the question is whether its new masters will be willing or able to pay. It is a poor lookout for Cuban creditors.—Monetary Times.

Shiloh's Consumption Cure cures where others fail. It is the leading Cough Cure and no home should be without it. Pleasant to take and goes right to the spot. Sold by Cyrus H. Bowes.

CANADIAN NEWS NOTES.

James Bays May be Invited to Winnipeg—Lawyer Osler Assaulted by a Female Litigant.

Manager Breitenbach and N. McMillan, of the Mikado, arrived in Rat Portage this week from the mine and brought with them an $8,000 gold brick, the result of April clean-up.

President Van Horne and R. B. Angus, of the C.P.R. directorate, leave tomorrow for England on a financial mission. Sir William also goes to recuperate his health.

Lady Tupper is at Winnipeg en route to Victoria.

A horrible fatality occurred in Dummer township, near Peterboro, Ont., yesterday, Alex. Smith, aged sixty, being trampled to pieces by an Ayrshire bull he was leading.

G. W. H. McKenzie, of New Richmond, Que., has failed with heavy liabilities and only $67 for creditors.

Mrs. Sarah Stevens made an assault on Mr. B. B. Osler, the celebrated criminal counsel yesterday. She entered his office and seized a chair, throwing it at his head and dashed down stairs. A male accomplice assisted her escape. She was a disappointed litigant and had been threatening Osler for some time. He is uninjured.

Capt. Van Staubenzie, Royal Artillery, has been appointed professor of artillery at the Royal Military College in succession to Capt. Lee.

In the event of the Northwestern regatta being held at Winnipeg this year an invitation is likely to be sent to the James Bay (Victoria) club, and Argonaut club, Toronto, to send crews to compete in the senior four events.

Toronto reports a renewed demand for War Eagle, the stock yesterday selling up to $1.47½ on transaction of 3,000 shares.

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