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ERN ARTILLERY.

Some Excellent Lessons in  
South African War.

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## TERMS USED IN WAR TIME

### THE PROJECTILES AND EXPLOSIVES NOW BEING USED.

How Guns Are Classified and Defensive Works Are Known—Some Interesting Facts About Matters That Are Mentioned Daily in the South African Campaign.

There are many more or less technical military terms brought into prominent and constant use by the war, the exact meanings of which are probably by no means clear to the average civilian. There is lyddite, for instance.

This terrible substance is practically identical with the French melinite and the German sorbitol, the base of all three being picric acid, which, in its turn, is a preparation of picric acid. It derives its name from the village of Lydd, in Kent, where was conducted the series of elaborate experiments which resulted in its adoption as the "high" explosive of the British army. Lyddite is not used for charging shrapnel but is tightly packed into thin cylindrical bombs of forged steel.

These burst into hundreds of fragments, which fly in every direction with incredible velocity. The bursting of a large lyddite shell means almost certain death to every living thing within 50 yards' radius, while absolute safety cannot be counted upon at a less distance than 1,000 yards. The fumes given off are deadly within a twenty-foot radius.

### PACKAGES OF DEATH.

Six different kinds of projectiles are known to modern artillery officers. They are common shell, shrapnel, case, galliser, segment and star shell. Only the three first-named, however, are likely to be used extensively in the present war. Common shell is a hollow, elongated, conical projectile, having at its head a percussion fuse, which ignites on impact. The interior is filled with cordite. It is used against fortified or entrenched camps and towns, and against masses of troops in the open. Shrapnel, on the other hand, is used almost exclusively against troops advancing in extended order. The fuse, as well as the bursting charge, is situated at the base of the shell, the whole interior of the forward part being filled with from 300 to 600 half-inch bullets, according to the caliber of the gun. The fuse is a "time" one, and can be "set" to explode the shell at any time between five and thirty seconds after it has left the gun. It should explode, by rights, about 20 or 30 yards in front of the enemy. The bullets then spread out fanwise, doing fearful execution. Case is only used at close quarters. It is merely a hollow metal canister, in appearance not unlike a small oil-drum or a large preserved-meat can, filled with a number of bullets. The shell is burst and the bullets scattered by the gun's discharge.

### VARIETIES OF GUNS.

Guns are either mountain, field, garrison or siege. The former are, generally speaking, the lightest and smallest of all; the latter are the heaviest. Among the former are "four-pounders"—that is to say, guns throwing a shot of four pounds' weight. Among the latter are found gigantic 110-ton pieces of ordnance, capable of throwing a steel shot, weighing three quarters of a ton, to a distance of nearly 13 miles. Guns are officially classified according to (a) the weight of the projectile; (b) the weight of the gun; or (c) the diameter of the bore. Thus, the pieces of naval ordnance which were used by the British at Ladysmith were spoken of as 47-inch guns, meaning, of course, that they measured 47 inches across the interior of the bore at the muzzle. This particular type of gun, by the way, is about the best all-round weapon, for it is a quick firer, a breech loader, and can take indifferently shells charged with either lyddite, cordite, or ordinary black powder. Its large sister, the 6-inch quick-firing gun, is capable, of course, of throwing a heavier projectile, but, on the other hand, it is infinitely more cumbersome and cannot be fired so rapidly.

### SAFEGUARDING A POSITION.

A permanent position, once taken up, is safeguarded by the defenders in various ways. The Boers "go into laager," which means, in plain English, that they surround themselves with a sort of zeriba, or wall of wagons. This is an excellent defense where the attacking force is unprovided with artillery, but shell fire quickly lays havoc with it, besides sending deadly splinters of iron and wood among the defenders. Trained troops rely principally upon earthworks, supplemented by a more or less elaborate system of wire-entanglement. The latter is constructed of telegraph wire, crossed and recrossed, and fastened firmly to pointed stakes driven into the ground at a height of about 18 inches. To the advance of cavalry a properly-constructed wire entanglement offers a well-nigh insuperable barrier, while even to infantry it proves sometimes very annoying, especially at night-time, and when, as constructed by the Spaniards in Cuba, it is made of barbed wire, it is the most troublesome clog to the enemy's progress that could be devised. Earthworks are usually strengthened by gabions—cylindrical baskets having neither top nor bottom—and sandbags.

### RIFLE PITS.

Nearly always, too, the defenders of

a beleaguered camp or garrison construct both shallow trenches and rifle pits. A very shallow trench will render a man, lying down, invisible to the distant enemy, and a very slight earthen parapet is sufficient to protect him from the effects of shrapnel, and rifle fire. Indeed, it has been ascertained from actual experience that the penetration of rifle bullets into newly-excavated earth does not exceed 21 inches at 500 yards, and three feet of earth may be considered safe at any range. A typical shelter trench is formed by digging a shallow ditch and piling in front of it the earth excavated. A rifle pit is dug in a similar manner, but it is isolated in place of being continuous, and is a deeper and more carefully constructed piece of work. A shelter trench takes one man half an hour to excavate; a rifle pit occupies two men for one hour.

### MENTIONED IN DISPATCHES.

This still constitutes a very great honor, and used to be even greater in days gone by. The General in supreme command, when sending home his reports, selects this officer or that for special commendation, either on account of his valor, his ability, his energy or some other distinguishing trait. The report is in due course published officially, and a synopsis of it also appears ever afterward in the "Army List" opposite his name.

An ordinary reconnaissance may be carried out by a party of ten or a dozen unmounted men, or by as few as two or three cavalrymen. Its object is to learn, as far as possible, the strength and disposition of the enemy. A reconnaissance in force is a far more serious and elaborate affair. A battalion, a brigade or a division—according to the enemy's presumed strength—marches out in battle array, but without any intention of giving battle. It often happens, however, that such a reconnaissance develops, against the wish of the General commanding, into a very serious engagement.

A cavalry screen is an extended line of vedettes, mounted sentries, which fulfills the double purpose of obtaining early and accurate information regarding the approach of an enemy, while preventing him from surprising the force it covers. A cavalry screen usually consists of one or, at most, two regiments, but where very large armies are in movement the screens are, of course, proportionately denser and more extended.

### ARITHMETIC BEFORE MOSES.

Very Much the Same Methods Used As in Our Time.

There was a ray of vindictive comfort for the modern schoolboy in the fact that for thirty-six hundred years his schoolboy progenitors have been worried by just such desperate problems in arithmetic as annoy him most. Among the recent archaeological discoveries in Egypt is a papyrus in excellent condition, dating from a period about 1700 B. C. This roll, which has a long heading beginning, "Directions how to attain the knowledge of all dark things," proves beyond a doubt that the Egyptian of that time had a thorough knowledge of the elements of arithmetic.

Numerous examples show that their principal operations with units and fractions were made by means of addition and multiplication. Subtraction and division were not known in their present form, but correct results were obtained, nevertheless.

Equations are also found in the papyrus. Here is one which brings the Egyptian schoolboy home to us: Ten measures of barley are to be divided among ten persons in such a manner that each subsequent person shall receive one-eighth of a measure less than the one before him. Another example given is: There are seven men, each one has seven cats, each cat has eaten seven mice, each mouse has eaten seven grains of barley. Each grain of barley would have yielded seven measures of barley. How much barley has been lost? The papyrus also contains calculations of area, the calculations of the area of a circle, attempts at squaring the circle, and finally calculations of the cubic measurements of pyramids.

### A LITTLE HERO-WORSHIPPER.

The most touching memorials made by hands are not the statues, tablets and inscriptions erected over the dead, but the simpler offerings of spontaneous affection.

In the crypt of St. Paul's cathedral in London lies buried Lord Nelson, chief among the naval heroes of England. Leaning against the marble tomb is a small square of perforated cardboard, worked as a sampler, which for six years has remained there undisturbed.

It bears these words, spelled in worsted letters: "In loving memory of dear Lord Horatio Nelson. 'Thy will be done,'" and was brought thither by a child whose heart was in this tribute to his hero.

The rules forbid the encumbrance of the stones by miscellaneous offerings, but the verger stood by and watched the offence committed, and the authorities have never ordered this true "In Memoriam" to be removed.

### PROFESSIONAL DINNER TASTERS.

A curious profession for a woman is that of dinner taster. She is a product of Parisian refinement, and spends a portion of each day visiting houses and tasting dishes intended for dinner. She suggests improvements, and shows the cook new ways of preparing dishes. The duties are pleasant, and the compensation ample.

## A COALITION OF POWERS.

### GREAT BRITAIN HAS FACED SITUATIONS FULLY AS GRAVE.

The Empire Has Often Been on the Point of Disruption, But Has Heretofore Emerged With Renewed Strength and Prestige From Every Conflict.

A coalition of European powers against Great Britain is threatened in case of either victory or defeat in her war with the Boers, and there are many straws which seem to show that the wind sets in an unfavorable quarter. It may be that at last this great power, vested in a little island, has reached its zenith and entered upon its inevitable disintegration, as all great nations have done in the course of time, but the doughty English have faced some formidable combinations of foes in years gone by, and have seen dark days when her highest Ministers have despaired of preserving their empire.

The first of these coalitions was what is known as the "Family Compact" between the branches of the house of Bourbon, by which France, Spain and the two Sicilies bound themselves by an alliance, the main object of which was to ruin England both by land and sea, but especially to wrest from her her maritime supremacy. Spain undertook to deprive England of all her trade with the Spanish dominions, in America, and transfer these commercial advantages to France. France, in return engaged herself to support Spain upon the sea and help her to recover Gibraltar.

### A FORMIDABLE ARRAY.

In the war which commenced in 1739 England had arrayed against her before the close, France, Spain, Prussia, Bavaria, Sweden, and Sardinia. But she held her own against them all, although she had on her hands at the same time the Jacobite rising of 1745. When peace was signed at Aix-la-Chapelle, on October 18, 1748, they came out even, for while England surrendered all that she had won by sea, France and Spain restored all their conquests on land.

But that peace only afforded a brief breathing space, and then came the Great Seven Years' War, when England had to fight for her empire both in the West and the East. France had made up her mind to oust them both from America and India, and again Spain was her ally. Disaster after disaster fell upon England. The Duc de Richelieu captured from them Port Mahon in Minorca, then believed to be the key of the Mediterranean. Admiral Byng, who should have relieved the place with a British fleet, hung back, did nothing, and was shot for cowardice. The Marquis of Montcalm was everywhere victorious over the redcoats in America. The British General, Braddock, was routed and killed. In such desperate straits was England that the usually impassive Lord Chesterfield, in the House of Lords, exclaimed: "We are no longer a nation," and he only echoed the thoughts and fears of the bulk of his fellow-countrymen. Then it was that William Pitt, "the Great Commoner," came to the rescue of his country. "I know," he said on first entering the Ministry, "I know that I can save the country, and I know that no other man can." And he spoke the truth. No sooner was his hand upon the helm than the ship righted herself.

### THE TIDE TURNED.

Victory followed victory in quick succession. First, came Minden, where six regiments of English infantry, mistaking the order given, advanced in line against the whole French cavalry, rolled back charge after charge, with their volleys, and in a single hour changed the fortunes of the day, turning a retreat into a victory. "I have seen," said the French General, Marshal de Contades, "what I never thought to be possible—a single line of infantry, break through three lines of cavalry, ranked in order of battle, and tumble them into ruin."

Close upon the heels of Minden came the great naval triumph of Quiberon, where Admiral Hawke, on a lee short, in the midst of a winter gale, with the sea rolling mountains high, got between the French Admiral and the harbor for which he was running, and simply wiped out him and his fleet. That put an end to the projected invasion of England.

Then away in Lagos Bay the old Cornish sea dog, Admiral Boscawen—"Old Dreadnaught" as his sailors called him—smashed up another French fleet under De la Clue.

From India came the news of Plassey and the marvelous triumphs of Clive which extinguished all French dreams of empire in the far East, while from across the Atlantic was borne the welcome tidings of Wolfe's victory over Montcalm at Quebec.

All the West Indian possessions of France were taken from her, and Spain was despoiled of Cuba and the Philippines. Britain was everywhere triumphant, and when the peace of Paris was concluded in 1762, while compelled to give up much that she had coveted, she was left in excellent condition.

### HER CRITICAL HOUR.

The next coalition was a still more formidable one, the most terrible combination of foes that Britain has ever had to face. In the war which began with the American Revolution, and ended in 1783, England saw, marshaled in arms against her, France, Spain, Holland and the revolted colonies of America, whilst every other European

Power stood aloof from her—all showing their teeth and snarling.

Single-handed, Britain faced the world, with Ireland, too, in semi-rebellion, crippling her hands at home.

The fleets of France, Spain and Holland threatened her supremacy on the sea. The surrender of Cornwallis to Washington at Yorktown, gave a deadly blow to her military prestige. Spain would listen to no proposals for peace unless Gibraltar were surrendered. France made it a first condition of negotiation that all the British possessions in India, except Bengal, should be handed over to her. The American Colonies would hold no parley with Great Britain unless she acknowledged their absolute independence.

Stripped of her colonies, robbed of her rule in India, deprived of her supremacy on the sea, what would have been left of the great world empire on which Britain had prided herself? Nothing.

And then came the turn of the tide. Rodney, the greatest of England's sea kings next to Nelson and Blake, met the Spanish fleet, nearly twice as large as his own, and out of twenty-seven sail of the line only four got back, battered and half sinking into Cadiz. Then, after standing a siege of three years against the most tremendous armament ever arrayed against a fortress, Gibraltar was saved.

Finally, on the 12th of April, 1782, Rodney intercepted the great French fleet under the Comte de Grasse, in the West Indies, and thanks to Warren Hastings, had vastly increased her possessions in India. She rose greater than ever after that war. And so ended the third coalition.

### FOES THAT NEVER SLEEP.

The fourth coalition against Britain was in 1797, when France, Spain and Holland united to drive her from the seas. But Sir John Jervis, afterwards Earl St. Vincent, gave the Spaniards at Cape St. Vincent such a thrashing as they had not had since the Armada. Admiral Duncan settled old scores with the Dutch once and forever at Camperdown, and annihilated the fleet which was to have covered the invasion of rebellious Ireland. Nelson swept the French flag from the Mediterranean in the battle of the Nile. Sir Sidney Smith saved Syria from Napoleon by the heroic defence of Acre. Sir Ralph Abercromby crushed the French army in Egypt, at the battle of Alexandria, and once more Britain triumphed over all her foes.

But the snake was scotched, not killed. In 1801, they had the fleets of France and Spain united against them once more, while the Czar Paul had formed a great naval confederacy in the north, in which Russia, Denmark and Sweden were to work together with France and Spain for the destruction of England's empire of the sea. But the prompt attack upon Copenhagen and the complete destruction of the Danish fleet knocked the scheme in the head.

The last naval coalition against Great Britain was that in which Napoleon massed the fleets of France and Spain in one mighty armament to sweep England forever from the seas, and lay her shores open to the great army of invasion which he had gathered at Boulogne. But therein he reckoned without Nelson, who met that vast fleet at Trafalgar and shattered it, leaving Britain undisputed mistress of the sea from that day to this.

One last card Napoleon had to play, and he played it at his famous Berlin decree of November 21, 1806, when he declared the British islands in a state of blockade, and prohibited all commerce and correspondence with them—all merchandise belonging to Englishmen was pronounced lawful spoil to whomsoever should seize it, and all trade in English goods was entirely prohibited.

Britain retorted with reprisals, in a similar spirit, and these brought about, as Napoleon had foreseen, a war with America. But though the wonderful little Corsican had Europe at his feet, and could sway it as he willed, his "Continental System," as he called it, failed. Russia doggedly refused to enforce it strictly, and brought about the campaign which ended in the fatal retreat from Moscow and the overthrow of Napoleon.

What shall happen next is more than prophets can foretell, but that something will occur is almost certain.

### THE LATE MISS MARRGAT.

The late Florence Marryat was interesting, not only for her own achievements as a novelist and an actress, but also as a link with the literary past as the daughter of our most classical writer of sea stories, Captain Marryat. She was his sixth daughter, and showed quite early in life a great taste for books. She was married at the early age of 16 to Captain Ross Church, of the Madras Staff Corps, and her first novel, "Love's Conflict," was published as long ago as 1865. Miss Marryat took an intense interest in the subject of Spiritualism, wrote a life of her father, and was at one time well thought of as a comedy actress and an entertainer, touring the British provinces and America with her own company. She was married a second time to Colonel Francis Lean.

### RACE OF DWARFS.

The Island of Luzon in the Philippines, contains one of the recognized races of dwarf men, the Aetas, whose average height is only four feet eight inches or four feet nine inches. They dwell among the mountains in the interior of the island, and are allied to the Andamanese, inhabiting islands in the Bay of Bengal. It is remarked by a recent writer that all of the dwarf races survive only in the most inaccessible parts of the continents or islands to which they belong.

## SHE CATCHES BUTTERFLIES

May Yeomans, an English girl, who settled with two brothers in California, has developed a profitable industry in catching butterflies. She had some knowledge of butterflies when she went there. One day a flock of yellow Pearly-like butterflies hovered a moment over her and then flew up the mountain side to a patch of yellow honeysuckle. She followed the butterflies up the steep mountain side. She thought she recognized them as a species known only in the higher Alps, and very rare and valuable.

"When at last I did get one in my hands I was sure it was the very kind," she said in telling about her new business. "I was too excited to wait till morning, which is the best time to catch butterflies, because they are sluggish then in the cold, damp foliage. I caught six before night, and the rest of the flock in the morning. I pinned one out carefully and sketched it in water color. I had to be saving of my postage, so I sent the sketch instead of a box of butterflies home to England. Such a long wait as it was! And fancy my delight when I had word at last to send all the butterflies to London. You would never guess what they offered me for them—\$25 each, and as there were twenty-three of them I had the tidy little sum of \$575, all my own, and the first money I ever earned in my life. That was my beginning, and I was always on the lookout for butterflies. With my money I bought tea fancy sheep."

Miss Yeoman's cellar is not for eatables, but is her nursery for beetles. What appears to be unsplit stove wood lies in rows on the floor. Each piece has been split, but tied together again, and in each piece are different species of beetles. They eat the wood, making their way out, and lay their eggs in the wood.

"I keep watch, and when a beetle gets to the surface I put it back," she said. "The most valuable one? It all depends upon the demand. A beetle is worth just what I can get for it. Dr. Le Fontain, who came from France to study the insects of California, came to our house by chance. He did not tell us who he was, merely that he was a stranger passing through the country, but when I chanced to see him before dawn, creeping with a candle in his hand under the pine tree, I knew he must be after insects. He was in raptures over a beauty he had found and when I told him about my butterflies and showed him what I had, he forgot all his English and rhapsodized in French. He taught me a great deal about beetles and told me of a certain one he was most eager to find in California. He believed it was here, though he could not find it. It had been found only in Italy, and had almost disappeared. Ah! You had better not look at it—you will be disappointed."

She peered about in a box of twigs, and produced what seemed a most ordinary little black bug with long, slender legs and then she placed beside it a little round red one, no larger than a pin head.

"The tiny one is the one which Dr. Le Fontain travelled miles and miles to find and could not—I found it. The other is the beauty he caught under the pine trees. You understand, a collection of beetles is not complete without all the different species. Some are very common, but others are most difficult to find. Dr. Le Fontain made me a sketch of the beetle he was looking for, and then we went out to find a mate for the beauty he had caught in the morning for where one is, more are sure to be. We found four and they were the ancestors of the ones I have here. He showed me how to make what we called a series. That is, a butterfly or a beetle in all its stages from the egg to the perfect creature—each stage shown by a specimen and tacked in order on a card. I always make dates as to time each stage requires and food and where the life was lived. He was so kind and interested I was delighted when at last I found the beetle he wanted. It was three summers later and I made a long journey for it. I had wanted for so long to go back to the Redwoods we passed coming up. You stopped in the woods and know how the silence of the great trees haunts one who has once known it. Brother Tom and I made the journey on horseback, and camped a week right in the heart of the belt. It was there I found my beetle. I carried a white sheet along and spread it on the ground. Taking up an armful of dried pine needles, I shook it over the sheet. If any of the fallen particles scuttled off I knew it was an insect, and one of the scuttling species was my long-wished for, much-desired beetle.

"The Indians know about butterflies, and know where to find them and they are the only ones who have ever helped me to any extent except for Chinamen and Indians; they see things which few of our own white civilized men can comprehend, even though it means dollars."

### A PERFECT WOMAN.

A woman of perfect figure should weigh 138 pounds and be 5 feet 5 inches tall. She should measure 5 feet 5 inches from the tip of one middle finger to the tip of the other when the arms are extended. The length of the hand ought to be just one tenth of the body and one seventh should be the length of the foot.