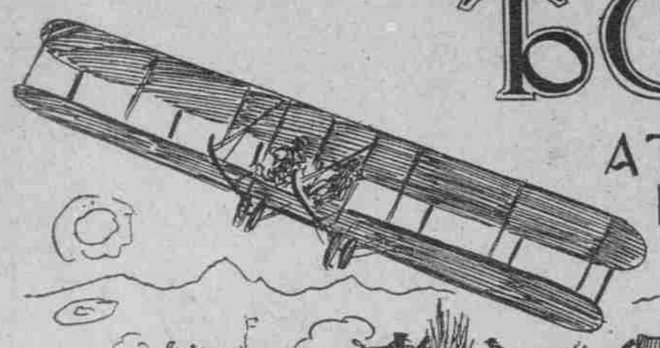
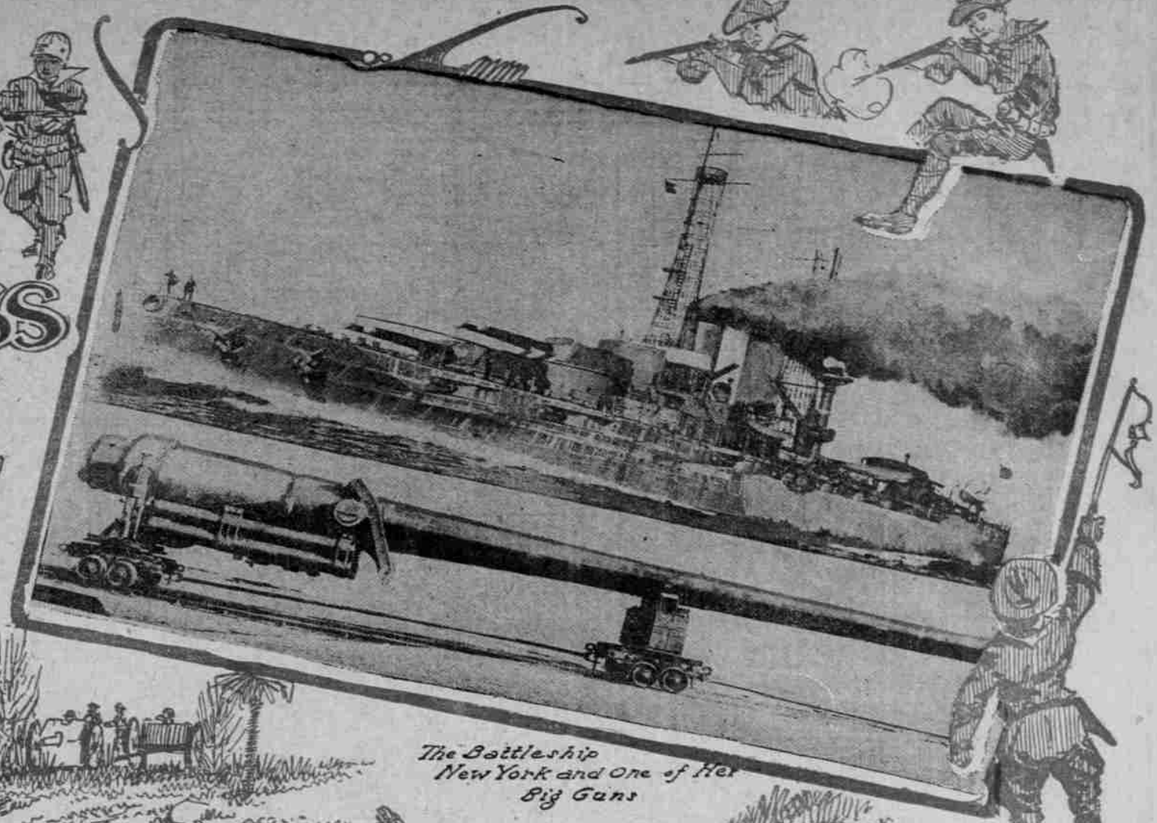
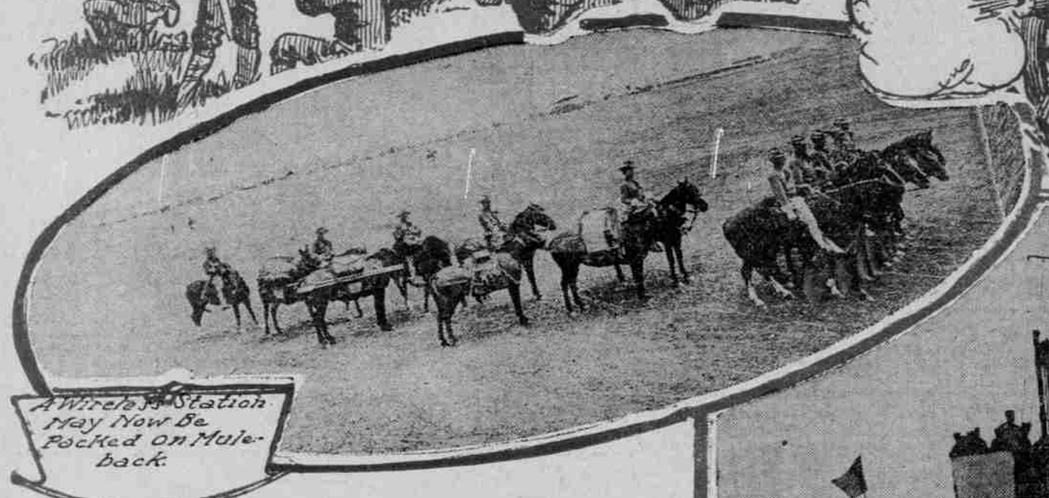
New War Machines Add Fearful Effectiveness To Grim Game

A Titanic Monster Indeed Is the Modern Fighting Organization.



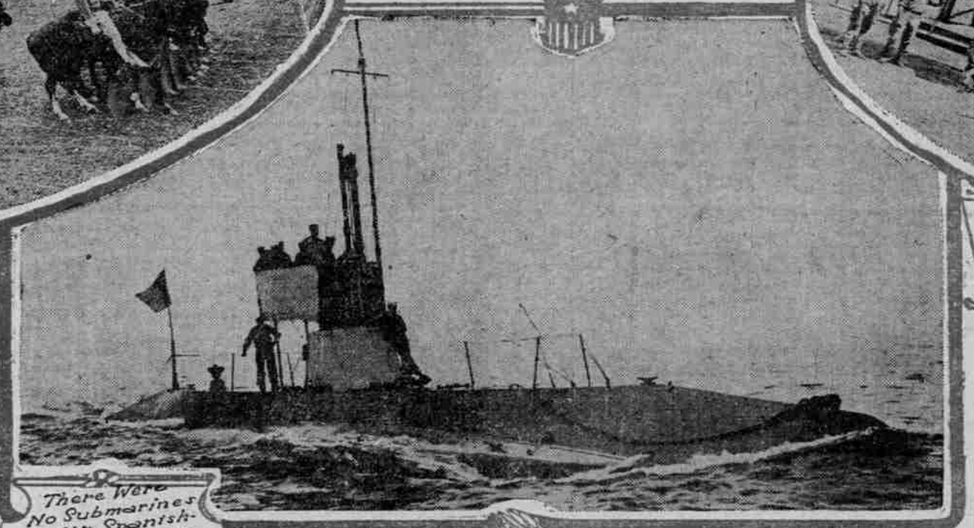


The Battleship New York and One of Her Big Guns

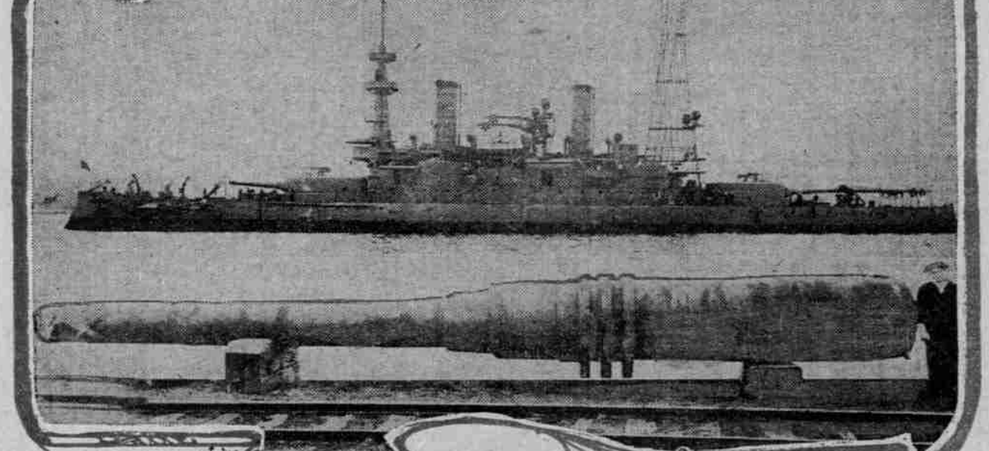


A Wireless Station May Now Be Packed On Mule-back.

Flying Machines Were Not Dreamed of When Funston Was Chasing Aguinaldo.



There Were No Submarines in the Spanish-American War.



Old Battleship Oregon and One of Her Big Guns.

The Torpedo Is a New Development

BY WILLIAM ATHERTON DU PUY.

THE modern dreadnought, developed since the Spanish-American war, could sink a fleet of 100 of the best battleships of that time and never be under fire.

The signal corps of the Army could erect in 15 minutes on any battlefield of Mexico a wireless station through which a commander could move his men like pawns and over which he could receive instruction direct from Washington. Yet wireless was unknown when Roosevelt went into Cuba.

The submarine of today may go beneath the surface, travel 100 miles in waters occupied by the enemy and drive home armor-rending torpedoes that break battleships in two, with no danger of discovery. Yet a decade and a half ago there was no successful submarines in all the world.

The air scouts of the Government could today scour the landscape far in advance of any invading column, report exactly the position of any enemy and even shell the defenders out of particularly difficult passes. Yet the most visionary man in all the Army never dreamed in the days when Funston went into the Philippines that soldiers would come to ride mechanical steeds into the air to shame the idea of seven-league boots.

There are scores of lesser war auxiliaries which would give the American soldier who fought in a war with Mexico such an advantage over his fellow who battled with Spain that one of the former should be worth 10 of those who have gone before. Some of those are brand new inventions which have called into play strange laws of the hitherto unknown while some are developments of principles long laid down.

A Comparison of Battleships.

The development of battleships in the past decade and a half has been such that the best ship of the Spanish-American war would be a mere plaything in a fight on the seas should one take place today. Comparative figures between the Oregon, prize ship of the Spanish-American war, and the New York, just completed, show the marvelous development during that span of time that has called forth the dreadnought.

The New York is practically twice as long as the Oregon and nearly three times as heavy. Its speed is a third greater than that of the old ship and it can shoot twice as far. It has 10 big guns as against four. Its main deck stands 25 feet above the water where the deck of the Oregon stood but 10. This latter point gives the new ship a vast advantage for the old vessel could not operate her guns if the sea was at all rough for her decks would be awash.

So the Naval authorities say that one New York could defeat 200 Oregons. By virtue of its greater speed it could maintain any distance it chose between itself and its numerous enemy. It would naturally choose to maintain a distance that was beyond the range of the Oregon's guns but within its own range. So might it pick off the old ships indefinitely as fast as they might come.

Wireless telegraphy was entirely unknown to the forces that participated in the Spanish-American War. During that unpleasantness, Marconi was experimenting with this unbelievable method of transmitting information in Europe, but a message had never been so conveyed on this side of the Atlantic. In 1899 Marconi came to this country and the first use of the system was demonstrated in reporting a yacht race for a metropolitan paper. A year later the Navy Department began an investigation of the possibilities of the new discovery, but it was not until 1904 that the development of it upon a utilitarian basis was begun.

But today all the activities of the Navy and many of those of the Army are directed by means of these messages of the air. The White House, the War and Navy Departments, have lines constantly plugged in to the great wireless station at Arlington. That station chats with Key West as two friends might talk across a dinner table. Key West reaches out to all the ships along the Mexican coast and directs their activities. The ships chat back and forth across Mexico, Vera Cruz and Tampico, comparing notes regularly with the commanders of ships at Guaymas or Acapulco or Salina Cruz on the Pacific.

Wireless in the Field.

In the Army the use of wireless is none the less interesting. When a great body of fighting men today spreads itself out over an area of 25 or 50 miles, there is no longer the necessity of couriers sent galloping here and there that the different divisions of the Army may be directed by its commander. There is no longer the mad galloping of messengers from the front to keep the main body informed as to the situation.

When a war column goes into the field these days there goes with it a wireless section. A dozen men and mules bear with them an entire outfit for establishing a wireless station in the field. The moment a position is taken this section sets about running up its wireless mast and stretching its wires. In 15 minutes the station is hammering out whatever instructions or information may be necessary. Other stations to right and left are picking up these messages. The base in the rear thus talks freely with the most advanced position. This position also picks up the information of the movements of all parts of the force. The sending force is capable of reaching out but 30 or 50 miles, but this is adequate for the purposes of these portable stations.

The Signal Corps of the Army has developed a 500-cycle radio-telegraphic packset, the operating part of which is inclosed in a box about the size of a suitcase. The mast for the antenna is madeup of nine sections, each 4½ feet in length. The antenna is of the umbrella type, that is, the wires radiate from the top of the mast. The counterpoise system of ground is used, a number of wires being laid out in various directions over the earth.

The generator for furnishing the necessary current is wholly inclosed, thereby preventing dust and grit from settling in the gear wheels, in the course of long journeys on muleback. The armature of the alternator is geared to the handles, which, when in action, are turned by two men. At full output this alternator delivers about 250 watts or about as much as would run five ordinary incandescent lamps.

While primarily designed to work with each other, these little sets can also communicate with such stations as Arlington, and would, under favorable conditions, have no trouble in receiving in Mexico messages sent out from that station.

The entire outfit is packed on two mules, but a third mule is used to carry accessories.

At the time of the Spanish-American War not a nation in the world had a submarine as an auxiliary to its navy. Even in the war between Japan and Russia that came half a decade later, the ship that dives was not used. Yet today the submarine flotilla of the United States is a military force with a little appreciated power of destruction. Along our own shores or in waters so accessible as those of Mexico, this flotilla could be depended upon to do work of great effectiveness.

In the Civil War and upon other occasions attempts had been made to go beneath the water and there maneuver to the disadvantage and destruction of an enemy, but no success was attained until within the past decade. But today the Nation has a score of sturdy, little submarines that can submerge themselves to a depth of from 50 to 200 feet, maintain it indefinitely and travel distances up to a hundred miles. At any stage of this trip the submarine can rise near the surface, stick its long neck into the air and, through a most delicate arrangement of lenses, look all about for what it would destroy. Having thus spotted an enemy, the submarine may launch its torpedoes with which it is almost sure to hit a battleship up to 3000 yards.

It may get closer to the enemy and be surer of its target. When its torpedoes are set on their careers of destruction, the submarine literally goes into its hole and pulls it in after it. It steals away under the water to safety.

The submarine, when on the surface, is propelled by steam. This power keeps the electric batteries it carries charged to capacity. These batteries can drive the little vessel under water at a maximum rate of 11 knots an hour. They can send it 100 miles without being again charged. Then, whenever the surface is reached, the steam engine again charges the batteries and the vessel is ready for another trip beneath the surface.

The depth to which a submarine may go depends on its strength from the standpoint of resisting the pressure of the water. The weight against the sides of the little ship increases rapidly as it goes down and the tendency to crush it as though it were an eggshell is increased. Journeys under the water are usually made at a depth of 50 feet. The American submarines are capable of going down 200 feet, they having a power of pressure resistance that enables them to go 50 feet deeper than those of European nations.

Bomb Throwing From Airships.

As man has become at home, since the Spanish-American War, in craft that go beneath the water, so has he ascended into the air and and there learned to perform many ingenious services to the war gods. At Vera Cruz are a score of men of the air ready to scout the way to Mexico City, to map every fortification that may be encountered, to locate every enemy, to drop bombs into every difficult defile. Yet when Americans went to Cuba and to the Philippines the name of Wright brothers was unknown outside of the small circle of customers who had bicycles mended at their shop in Dayton.

It was not until 1908 that the first demonstration flight was made for the Army at Fort Myer and Lieutenant Selfridge went the way to death in which many a daring spirit has since followed. Yet in the six years that have since transpired, the flying machine has been so perfected that it has become an important adjunct to both Army and Navy.

Still another implement of warfare that has developed marvelously since the Spanish-American war is the torpedo. That marvelous piece of mechanism was in its infancy 15 years ago. It could be used effectively at a range not greater than 800 yards, as compared with 10,000 yards at the present time. In its head there was then 110 pounds of guncotton, as against 300 pounds at present.

The stealthy torpedo-boat commonly called the destroyer, is the dread of the battleship by night and in the fog. Its guns are unimportant and its work is done almost exclusively with the torpedo. The submarine, that strongest of coast defenses, the stay-at-home boat, that makes the entry of the waters of a warlike nation so dangerous, likewise uses the torpedo exclusively. The developing use of this implement of destruction is, however, in its adaptation to the battleship itself.

The torpedo of today is a steel cartridge some 12 feet long. Its forward end is blunt and it tapers toward the tail, where are stationed the rudders and the propellers. It appears to be in one piece, but there are really three parts to it, and it may be disjointed. It is an automobile and propels itself.

The Machine That Thinks.

All this is of interest only that it leads to an understanding of the remarkable feats performed by this machine. In the body of the ship far below the water line is the torpedo-room. Here the torpedoes are kept and here is the torpedo tube which discharges them into the water outside. From this tube the torpedo is started on its way by compressed air, for it is a self-propelling machine and needs only a start in order to make its two-mile journey.

The remarkable thing is that the torpedo is merely thrust into the water from whatever position the ship occupies. It is, however, so adjusted that it will automatically find a certain level below the water, will turn in the direction it is intended to take, will operate its own propellers and go careering merrily through the water to its target.

The manner in which it does these things is interesting. In the first place it carries a complete turbine engine, and this engine runs two little propellers at the tail. The engine is operated by compressed air, and this air had been forced into the air chamber of the torpedo until it is under tremendous pressure. This supplies the force that carries the torpedo to its destination.

When the torpedo is thrust into the water there is a drum in a certain portion of it that is exposed to the pressure of the sea. The pressure will be greater or less in proportion to the depth at which the mechanism finds itself. The drum adjusts itself accordingly and in doing so operates a rudder at the tail of the torpedo. This rudder brings the torpedo to the depth below water for which it has been set. So will it keep at the depth below water line at which it is desired that the target should be hit.

The most remarkable of all this mechanism is, however, the operation of the gyroscope, which is the teamster that drives this instrument of destruction toward its ultimate destination. The position of the torpedo tube at the time of its discharge has been such that the torpedo has started on its career pointed at a considerable angle away from the direction of the target. From observations taken at the time of firing, the angle of divergence between the tube and the target is accurately known. The gyroscope is so set as to correct that divergence. The little teamster pulls to right or left until its horse is going straight ahead. In fact that gyroscope is set whirling in a position that is exactly parallel with the target. It will hold that position regardless of any angle, up or down, right or left, that may be assumed by the torpedo. It not only holds that position but it pulls on the vertical rudders of the torpedo, holding them exactly on the target. In the course of a few hundred yards the torpedo will have righted itself in accordance with the dictates of the rudder and the gyroscope and will be traveling in exactly the direction aimed.