

How the Battles of the Future Will Be Fought

Physics and Chemistry May Decide Them and Our Big Battleships Be Useless.

From the Philadelphia Press.

"The next armed conflict in which Uncle Sam is called upon to engage will be a war of physics and chemistry. We are on the edge of a great revolution in the art of fighting, and before long the methods of warfare most approved today will be regarded as wholly out of date.

"Twenty years ago from now, reckoning at the very farthest, there will be no floating fortresses of the kind which we call battleships; they will be considered as representing an obsolete type of naval architecture, and their place will be taken by vessels comparatively small, yet infinitely more formidable and destructive.

"By that time, also, electricity will have made its way as an active agent of destruction and military engines of all sorts will have assumed forms as yet undreamed of."

"The remarks above quoted were made by a government engineer, and are of the foremost scientific men in this country. Imposing the condition that his name should not be mentioned he proceeded to develop the idea by a series of suggestions so striking as to excite the utmost interest. He said:

EXPLOSIVES.

"To illustrate the tendency of the development of warfare at present I will refer to the wiping out of the battleship Maine. I could have taken just about three men to accomplish the destruction of that gigantic fighting machine if they had a large quantity of nitro-glycerine or some such high explosive, packed in bags impervious to water. In each bag they might place just enough cork to give the contents the specific gravity of water approximately. Dragging the bags, one or more of the men could have swum out to within a short distance of the ship, then dived and swam under water to escape observation and came up under the safe shelter of the side of the vessel. To attach the bags to the bottom of the ship would have been easy, and a chemical time fuse that would burn under water could be ignited readily enough, permitting the assassins to swim away at their leisure.

"In some such way as this the Maine could have been destroyed. I only cite the case to illustrate the ease with which a mighty warship of this description can be destroyed by two or three determined men, at a minimum of cost. A few dollars' worth of high explosives will wipe out \$1,000,000 worth of fighting machinery and several hundred lives.

"If half a dozen hostile vessels of war ventured into the harbor of New York they would be annihilated very quickly, not by our own warships, but by small groups of courageous men with so-called infernal machines of one kind or another. When this sort of thing can happen, it is only a matter of time before the fighting ship of the type described is out of date. The modern battleship is constructed, so to speak, on a gunpowder basis; in the building of them no more account is taken of high explosives than if there were no such thing. But it is perfectly certain that the wars of the immediate future are to be prosecuted with high explosives.

NEVER TRIED.

"You must remember that as yet no adequate test of the efficiency of battleships has been made in practice; they are built on theory. What does their strength amount to, the thickness of their armor and the weight of projectiles they can throw, if they can be so readily destroyed? They represent a putting of matter in the wrong place. In a museum of natural history you will see the skeletons of many extinct animals which have lived at various epochs of the earth's history. You can tell at a glance the very ancient skeletons from those which belong to creatures of more recent times, because the latter are so much lighter and more graceful, representing improved types. In one of these great warships you see a massing of material regardless of expense and without regard to practical conditions. Therefore, this species of vessel is doomed to early extinction. He the huge and unwieldy mammoth of the Pliocene.

"The great warship and the great gun are the naval ideals of today. Both of them are based on what? On gunpowder. Modern forts, both on land and on sea, are built on a gunpowder basis, and without any consideration of high explosives. The very brains of army and navy men all over the world are adjusted to gunpowder, as it were. Military experts, generally speaking, are unable to think of war except in terms of gunpowder. Yet gunpowder is practically out of date.

TORPEDO BOATS.

"The day of high-power explosives has arrived; they constitute the postulate to which ideas of warfare must be adjusted. These explosives have carried the art of war beyond the stage when the battleship can be useful. With their aid it is as easy to destroy the strongest armored ship as to smash up a wooden schooner. It is not possible to predict with confidence just what the character of the fighting vessels of the future will be, but a suggestion in that direction seems to be afforded by the torpedo boat. A torpedo boat costs \$75,000, and you can build a whole fleet of such craft for the cost of one battleship.

"The advantage of high explosives is that only a little power is required to convey them to the place where they are to do work. Their adoption as a means of destruction is certain to introduce an entirely new series of inventions for war. The development of the art of war from this time on will be a battle of invention. If hostilities should break out between Spain and the United States, invention in this line would be marvelously stimulated.

INVENTIVENESS.

"Has it ever occurred to you to think of the fact that during our own Civil War a greater number of fighting machines were invented than in all the history of the world up to that time? The Franco-Prussian conflict gave a

great stimulus to military invention. We, of course, are a nation of inventors. A war with Spain would bring into existence many contrivances for destruction far surpassing what has hitherto been devised. The Spaniards, themselves, not fit all an inventive people, would think that they had come up against a nation of devils.

"It is logically proper to assume any absurdity for the sake of argument. Let us assume, then, that we were driven from the seas actually by the Spaniards, and that our defeat was absolute and overwhelming. The wiping-out of the whole affair would nevertheless be the total wiping-out of Spain; for we would build vessels adjusted to requirements.

"There is no telling what we might do with electricity, which doubtless is destined to play a part in future warfare as an active agent of destruction. Telegraphy without wires is as yet in its infancy, but something very substantial in this line has been accomplished already. If we can convey, as we do, to a distance and without a wire, enough energy to communicate intelligence, we shall be able before long to convey enough energy to work machinery. As our control of electrical energy becomes more complete we can extend its reach further and further. It does not seem wholly improbable that the time will come when we shall be able to explode the magazine of a ship without going near it.

THE VESUVIUS.

"The only attempt thus far made by the United States in the direction of utilizing high explosives for purposes of naval warfare, if torpedoes be excepted, is represented by the so-called dynamite cruiser Vesuvius, which is now in the neighborhood of Key West. This vessel has on her forward deck three 15-inch guns which throw projectiles loaded with dynamite a distance of a mile. The ship is only an experiment, and her practical utility is regarded by naval authorities as very doubtful. The problem of throwing high explosives with safety to those who use them has not yet been solved satisfactorily. No explosive is good for fighting purposes that can be touched off by shock or otherwise than by actual contact with fire. The stuff called 'explosive gelatine,' for example, is the most powerful of all known explosives, being fifteen times as strong as gunpowder. It is made by dissolving gun-cotton in nitro-glycerine, the preparation having the consistency of honey. But it is very unsafe for use in battle, because a bullet striking it will set it off by concussion.

DEADLY GASES.

"It is extremely likely that in the next great war shells that liberate poisonous gases on explosion will be employed. It has been suggested that bombs loaded with hydrocyanic acid gas under pressure could be thus utilized, releasing such fumes on bursting as would destroy all life in the neighborhood. The French 'melinite' has for its base a coal-tar product termed picric acid; its consistency is about that of molasses, and it is poured into shells and permitted to harden. This stuff is entirely safe to handle, though three times as powerful as gunpowder. The fumes set free by the bursting of a bomb loaded with it are most deadly. A single one, fired experimentally at a vessel on the deck of which had been placed a number of sheep and goats, killed by suffocation all of the animals that were not destroyed by the flying fragments. If a shell loaded with hydrocyanic acid gas—this is the same thing as picric acid, and the deadliest of all poisons—should be fired into a ship and explode inside of the vessel, pretty nearly everybody on board would surely perish.

"In the recently published novel, 'War of the Worlds,' which describes an attack by Martians upon the earth, the assailants from the sister planet are represented as destroying immense numbers of people by letting loose a cloud of black vapor that sinks to the ground and smother to death every living thing. The author may have had in his mind bisulphide of carbon, an extremely explosive substance which readily resolves itself into a more deadly gas when exposed to the atmosphere. This gas is heavier than air, and so sinks. The newly invented 'smoke grenades' are filled with chemical substances which, on explosion, produce clouds of dense black smoke; they are intended to be carried in advance by skirmishers and thrown so as to conceal the troops following. A novel German contrivance is a bomb, which on exploding, scatters highly inflammable substances far and wide. A single one bursting over a town would set a whole district on fire at once. This kind of infernal machine is designed also for burning ships at sea.

BALLOONS.

"Respecting the prospects of using balloons and flying machines in war, a great deal has been said, but it is all highly speculative. Balloons may be employed to drop explosives, but they are not very manageable, being to a great extent at the mercy of air currents. Nevertheless, it is said that both Germany and France now have balloons that can be steered and propelled against a pretty strong breeze. It goes without saying that if a really practical flying machine should ever be devised, it would wholly revolutionize warfare. No fort could be built that would be strong enough to withstand high explosives dropped from above, and ships would be equally exposed to destruction. Under such conditions, warfare would necessarily be transferred from the land and sea to the air, and the quarrels of nations would be decided by battles between fleets of airships.

"Chemistry and physics, as I have said, will be the basis of the warfare of the future. Under the former of these two heads comes photography, which will be largely employed. The latest invention in aerial photography is intended for military use. It is a bomb containing a camera and a parachute, and is fired vertically into the air from a mortar. When 1,000 feet or so above the earth it explodes, liberating the camera, which is upheld in the air by the parachute. Then the camera takes one or more snap-shot pictures of the landscape below. It is weighted sufficiently to make it sink pretty rapidly, so that it lands not far from where it started, and is promptly picked up. Obviously, photographs thus taken will be of the utmost value

to a commanding general in war time, giving him a survey of the field, of the distribution of the enemy's troops and of hostile entrenchments and fortifications. Such bombs might be utilized to advantage by warships at sea, for obtaining notification of the approach of a hostile fleet long before the vessels have in sight. Owing to the curvature of the earth, a ship is invisible at a distance of only a few miles on the ocean. In this case the parachute and camera could be provided with a compassion float, so as to be found and recovered readily after reaching the water."

BRITISH ELECTION SPEAKER.

The British workman may not be a particularly clever gentleman, but he fairly bristles with peculiarities. Education has not wiped away his characteristics. He still has opinions of his own and can still find something original to say for himself. Now does he forget to say it. It gives him special pleasure to state his views at a meeting of his political opponents. He will organize an opposition meeting in the middle of the hall and proceed to address it himself. Or he may confine his attention to the speech of the evening and cast humorous doubts upon its author's political information.

I have known a meeting thrown into utter confusion because a speaker happened to mention the year 1841 and a workman insisted on knowing, before they went any further, who was King of England at that time. The speaker, a trifle uncertain himself as to whether it was George III. or George IV., refused to answer, and the workman's thirst for knowledge had to remain unquenched—unless the policeman who cast him forth was able to satisfy it.

In England these interruptions are taken as matters of course. A speaker expects to find a sprinkling of opponents among his audience, and the consciousness of their presence makes him more careful in what he says, more precise and argumentative than if he were addressing a purely partisan



gathering. The man who faces a meeting can always be certain of the measure of his success or failure. No English audience will stand a speaker who bores them. If he fails to prove attractive he is informed of the fact with a singular absence of bashfulness. It is not a good advertisement for our national manners, but it keeps a meeting lively and puts an effective check on pompous dillards. Some kind of sport we must have, even in our politics. In the good old days dead cats and rotten eggs used to come flying like bewildering meteors round a candidate's head. Now he is "hooked" and pelted with questions instead. A man in the audience is allowed to catechise him on every article of his political faith, to inquire into his votes in the House of Commons, and to ask him how he stands with regard to particular measures. And by the custom of the country the candidate is bound to answer all reasonable questions fully and definitely.—Sydney Brooks in 'The Chautauquan.'

Gerson's

The Largest Exclusively Millinery Store in the State.

PICTURE HATS Are Fashion's Latest Fad.

Our Hats and Bonnets Have a Beauty You Will Never Tire of. Their prettiness lends so much piquancy and "style" to the face that a look in the glass is generally sufficient to make the customer say "I'll take it." Our low prices increase the satisfaction of wearing such headgear.

Stylish Straw Shapes.

Just opened and fresh on tables, newest and prettiest effects in Chips, Rough Braids and Milan Straws.

New shapes in Chips and Fancy Straws, large Hats, small Hats, Turbans and Toques, worth \$1.00. Here at **39c**

Panama Short Back Sailors, Fancy Braid and Chip Sailors worth \$1.50, here at **98c**

Hand-made Fancy Braid Hats in the new "sheppardess" effect, usually sold at \$2. Here at **75c**

Bargains in Flowers.

Large bunches rich Rose and Violet Foliage, worth 48c, here at **19c**

New Bluetts, large, full bunches, worth 50c, here at **19c**

Fine Velvet and Silk Sweet Peas, beautiful shades, worth 62c, here **25c**

Large full bunches, Imported Clover, in all colors, worth 50c, here at **19c**

ROSE SPRAYS in every color at 9c, 15c, 19c and 25c. Worth double.

A Ribbon Bargain

All Silk Taffeta Satin and Mousseline Ribbon, No. 60, in all the newest and hard to get colors. Here at **25c yd**

GERSON'S,

413 LACKAWANNA AVENUE.

All Goods Exchanged or Money Refunded if Not Satisfactory.

KEEP YOUR



ON OUR WINDOWS.

...SATURDAY...

AT SAMTERS.

KEEP YOUR



ON OUR WINDOWS.

Boys Suits--Long Pants

The boy should be as well dressed as his papa, and he will be if the suit comes from our store. Some of the handomest new things in club checks, overlaid effects, blue and black chevot qualities and prices that you won't find elsewhere

\$5 and \$6.

Boys' Reefer and Two-Piece Suits

Exclusive patterns in double-breasted suits, ages 8 to 15 years, double knee and seat in pants, plaids in the overlaid effect, blue and black chevot. These suits are the greatest values we have yet offered you, the assortment will soon be broken at these prices

\$1.98, \$2.25.

SPECIALS.

Fancy Silk Marked Hose The kind exclusive furnishiers ask 25c for. Our price **15c, 2 pairs 25c**

Suspenders

Strong and serviceable, made in all the latest colorings **19c**

Balbriggan Underwear

A medium weight, just the thing for Spring **25c.**

Negligee Shirts

In neat oxfords patterns, with two collars and attached cuffs, a shirt that is good value at 75c. Our price **48c.**

KEEP YOUR



ON OUR WINDOWS.

Save Your Dollars!

You can do this by buying your new Spring Suit here. We maintain good good quality; that's where we differ from other clothiers hereabouts, who constantly lower quality in order to lower price. Beware of that poorly made stuff. Our make will soon convince you where you save dollars.



\$8.00, \$10.00, \$12.00 and \$15.00.

Save Your Dollars!

Here is a chance for you! Saturday will clear our counters of a good many Overcoats, if price and quality count for anything. Strong values, style, workmanship beyond criticism, tailored in that Samter way so well known here in Scranton. Handsome and desirable top coats that have been sold here for a much higher price. A splendid chance for your dollars Saturday.

\$8.00, \$10.00, \$12.00 and \$15.00.

Where did you buy your last hat? 10 to 1, at Samter's. Have you seen the variety of styles displayed in our show windows? Look at the prices; we save you 50c. on any hat you may choose. All the latest Dunlap, Miller and Knox shapes are found here, in all the newest colorings, black, brown, pearl, tan and the new covert shades **98c, \$1.50, \$2.00 and \$2.50.**



Pretty Vestee Suits

And the reefer style with fancy braided collar and pants, there are styles and designs that you will find in no other stock but here. Our prices are the very lowest, ask your friends about these Suits **\$1.98, \$2.50.**

Faunterloy Waists and Fixings

Blouse Faunterloy Waists in fancy colors, always sold for 75c and \$1.00. Our price for Saturday **48c.**

Children's long black Hose, guaranteed fast dye **15c.**

Boys' fancy Shirts, two collars detached, cuffs attached **48c.**

Boys' Collars that a worn with Vestee Suits, a sizes from 3 to 8 years **10c, 3 for 25c.**

SPECIALS.

Japanette Handkerchiefs As soft as spun silk, in fancy border or plain. Initial **15c, 2 for 25c.**

Collars

All the latest shapes in stand up or lay down, 4-ply pure linen **10c, 3 for 25c.**

Golf and Bike

New fancy top colorings. Our price for Saturday **48c.**

Golf and Bike Shirts

Made of madras cloth and woven in fine effects, with two detached collars **48c.**

ON OUR WINDOWS.



KEEP YOUR

SAMTER BROS.

Clothiers, Hatters and Furnishers.

DR. E. C. WEST'S NERVE AND BRAIN TREATMENT
 "Red Label Special" Extra Strength.
 For Impedency, Loss of Power, Loss of Memory, Nervousness, Headache, Dizziness, Vertigo, Insomnia, etc.
 Guaranteed to cure in 30 days. At stores before and after.
 Wm. G. Clarke, 326 Penn Ave., Scranton, Pa.