

Most Destructive Explosives in the World

Dunnite, a New Secret Preparation Owned by the Government, Can Destroy Battleships as if They Were Made of Pasteboard

Most destructive of all explosives used in warfare is dunnite, a new secret preparation owned by the United States.

So sensational have been its performances that foreign governments, in alarm, are endeavoring in every way to learn the composition of the new explosive.

It has been demonstrated in recent tests at the Sandy Hook proving ground that a 12-inch shell, loaded with only a small charge of dunnite, will demolish the sides of the heaviest battleship like paper, even though the shot fall 20 feet away.

Dunnite possesses the merit of tractability. It does not explode upon impact, but by means of a fuse after entering the side of a ship. In this way the greatest damage may be done to the vessel's vitals and personnel.

Army and Navy officials regard it as the most destructive explosive yet discovered, and the best possessed by any government in the world.

Major Beverly W. Dunn, of the United States Army, now stationed at the Sandy Hook proving grounds, belongs to the credit of having discovered this new high explosive. From him it takes its name.

It is far superior to any of the other high explosives of war—maximite, lyddite, tholite or shimos.

Lyddite attracted general attention through its use by the British during the Boer War, but it seems never to have measured up to all the extravagant claims made for it.

Shimos powder has been extensively used by the Japanese during the present conflict in the East, and much of their success has been attributed to it.

Major Dunn, when questioned recently about shimos by a reporter of the Philadelphia North American, stated that so far as he knew it was simply picric acid, a high explosive, the properties of which are well known. A shell, however, cannot be loaded with picric acid, and fired through an armor plate without explosion upon impact.

"Even a layman can readily understand the advantages of an armor-piercing shell over the ordinary bursting shell," the officer said.

"In order to inflict the most damage upon an enemy's fleet, he must have armor shells enter his ship, and then, bursting into large fragments, carry destruction to its machinery and vital parts.

"A shell bursting into small fragments would not do that. Tests have shown that dunnite will do all the things that are most desired in actual warfare."

Dunnite, in comparatively small charges, is placed in large shells with thick walls. When the shell is broken up by explosion, the fragments are large and heavy enough and are thrown in all directions with sufficient force to do immense damage.

Explosives Inside the Ship.
"The composition that bears my name," Major Dunn explained, "is not the highest explosive known, but it is the highest explosive so far invented that, contained within the chamber of an armor-piercing shell, will contain itself until after the shell has passed through the armor at which it is aimed."

"Then its destructive work, actuated by a primer, takes place. That is the time when the destructive force is wasted after the shell has reached the interior of the opposing ship."

Known only to the inventor and to a few officials of the United States Ordnance Department are the ingredients that enter into the composition of dunnite. It is understood, however, that they are abundantly produced in Europe, and manufacture of the explosive offers no special difficulty.

This manufacture has been going on quietly for some time. The arsenal of the United States are now filled with dunnite shells, and almost all the ships of the Navy and the seacoast fortifications have a battle supply on hand and ready for any emergency.

Dunnite is in the form of a powder, and is loaded by compression. Compression can be given without danger, and has been carried as high as about 30,000 pounds per square inch.

It is estimated that with a suitable press, a 12-inch shell containing 85 pounds can be loaded in 15 minutes. Dunnite may also be loaded by hand and without a press, but not so compactly, and, therefore, not so efficiently.

In order to make his explosive more effective—that is, to do its work at the proper time—Major Dunn invented a detonating fuse, with which his explosive shells are loaded. This was necessary, because dunnite was found to be peculiarly lacking in sensitiveness to severe shocks, and, for this reason, not liable to explode upon impact.

Use of the fuse delays the explosion until the armor-piercing projectile has got well into the vitals of the object of attack.

The material may be fired from high-power guns with full charges. It is particularly adapted to use in the monstrous 12-inch rifles of battleships and shore fortifications, as these great guns are relied upon to penetrate the thick steel sheathing of modern warships or the resisting walls of forts.

Safe to Manufacture and Handle.
Not alone because of its destructive qualities is dunnite valuable. It may be manufactured and handled with safety, which cannot be said of some other high explosives.

Tests have shown that it is capable of withstanding the maximum shock of discharge from a big gun. It has been fired under a pressure of 37,700 pounds per square inch.

Its strength is such that a charge will explode the largest, thickest-walled shell, hurling the fragments about with terrific force.

Easily kept, too, is dunnite, holding its properties under almost any conditions of atmosphere or storage. The material used in the recent tests at Sandy Hook had been stored there for some time in unsealed boxes, without any precaution for protection from air and moisture. It is practically proof against moisture.

A dried sample exposed to a saturated atmosphere for 15 days absorbed 0.13 of 1 per cent of moisture, and another for 20 days absorbed 0.11 of 1 per cent. Similar samples of maximite, probably the next most remarkable explosive, absorbed 0.23 and 0.27 of 1 per cent in 21 days.

Taken as a whole, therefore, dunnite is considered by experts to be the safest and most reliable of explosives for armor-piercing shells, as well as giving the results most desired.

pounds and 7 ounces, including 15 pounds ounces of the high explosive, struck the center of the target with a velocity of 1800 feet per second, corresponding to a range of 4600 yards. The striking energy was 22,500 foot tons.

"The shot penetrated the plate and was exploded just in the rear. The backing, the skin plates, frames and cofferdam plates were completely demolished in the line of the impact. The structure in the sand butt in the rear of the structure measured 15 feet by 64 feet.

"Pieces of the plate and projectile passed through the structure in the sand butt, and were recovered at distances of 150 and 200 feet in the rear of the butt. The rivets in the top plate were sheared, the side plates of the cofferdam were backed about three inches, and the plate was forced back bodily about three-fourths of an inch.

"It is evident that had this shot struck a battleship, it would have wrought serious damage to the vessel.

Tears Steel Plates to Bits.
"The next shot, weighing 106 pounds and including 25 pounds of high explosive, struck the top plate of the armor with a velocity of 1804 feet per second, corresponding to a range of 4600 yards. The striking energy was 22,500 foot tons.

The shot detonated in the plate, completely wrecking the right-hand portion and demolishing the frames behind the armor and the plates of the cofferdam. It is evident that had this shot struck a battleship it would have wrought serious injury to the vessel.

"A 12-inch armor-piercing shell, weighing 106 pounds, including 25 pounds of the high explosive, struck the lower left hand center of the plate with a velocity of 1803 feet per second, corresponding to a range of 4600 yards. The striking energy was 22,500 foot tons.

"The shell penetrated and exploded in the plate. As a result, the armor plate was totally wrecked, and the backing, frames, beams and cofferdam plates of the structure were completely demolished. An opening was made through the plate four feet wide by eight feet long.

"The lower left hand quarter of the armor plate was broken into six large fragments and smaller ones. The largest being about 4 1/2 feet square, which, with the backing and skin plates, was torn loose from the structure and turned inward, so that the left-hand edge of this fragment was in the plane of the original face of the plate.

"One large fragment, about two feet by 2 1/2 feet by 1 1/2 inches, and weighing about 250 pounds, was buried through the target, through the butt and was recovered 135 feet in the rear of the butt. Numerous fragments of the plate and projectile passed through the target structure, through the butt and were recovered in the rear. The effect of this shot would have resulted in serious injury to a battleship.

"Another interesting test of dunnite's destructive powers when exploded in the water was made at Sandy Hook.

A floating mass of woodwork, the size of the hull of a small vessel, was submerged in four feet of water and fixed about 50 feet from the floating structure, was a 100-pound projectile containing 30 pounds of dunnite.

When the testing committee had retreated to points of safety, an electric button was pressed, through which the ground trembled, while a column of water shot up into the air 250 feet. When the target was again brought to shore the effect of the explosion was plainly manifested and of the nature of the questions were readily drawn. No battleship could have withstood that terrific blow.

We Need More Ships and Big Guns
So Says "Fighting Bob" Evans, and Discusses the Battleship as a Profitable Investment.

WHILE the squadron of battleships were lying in the Hudson recently, Rear-Admiral Evans was interviewed by a reporter of the New York Times and spoke freely on a topic that interests every American. He declared:

"A battleship is never an ornament, as so many people suppose. It is always useful. But it is more useful out of than in a fight. Its dominant mission is to give peace a meaning and war a warning to the world. And because this is so we of the United States need more and bigger battleships.

"When I say that a battleship is more useful, it is a more profitable investment even in peace than in war. I mean that it is the greatest and surest preventive of war that the centuries have as yet produced."

"I pursued the Admiral earnestly. 'It takes time to build battleships, and when we need them for we need them badly. This is shown in the case of Russia. What would Russia not have given for the battleships of this squadron?' sweeping one hand toward the monster ship and the other toward the north and south. 'It was worth its weight—almost its weight in rubles to her.'

"But Russia must have considered herself better prepared for war than events have demonstrated," he ventured.

"Nobody outside of Russia thought so," declared Admiral Evans. "Nobody outside of Russia expected any other result from the battles of Port Arthur and the Korean Straits than the one recorded. It was simply a case of one power being fully prepared and the other poorly prepared for war."

"Do you agree with those who attribute the Japanese naval success largely to torpedoes and submarines?" "No, sir," emphatically. "The Japanese battleships and big guns have themselves decided every naval engagement of the war. But to better answer the question, how long do you suppose it would have lasted outside of Port Arthur Bay had there been no Russian battleships inside? Or how long do you suppose the Russian ships would have been bottled up had there been simple torpedo boats and such dragon-fles to reckon with instead of a blockading squadron of efficient battleships? Not long, we may be sure."

"And yet," quickly added Admiral Evans, "there is no advantage in having all the battleships in the world if the man behind the gun is poor maned. Russia has been supremely unfortunate in not knowing how to shoot straight. Japan, conversely, has been fortunate, for she owes her good fortune not to chance nor to any superior intelligence, but to practice, unremitting, oftentimes monotonous, always careful and painstaking target practice in all sorts of seas and weather."

"Those in the profession who are inclined to the opinion that Admirals Alex. J. and Jostynsky would have furnished stubborn obstacles to Admiral Togo had their gunners been better marksmen of gunnery are perhaps right," believed Admiral Evans. "Their respective squadrons, plus good marksmanship, were highly formidable weapons of war."

"As for torpedoes," he pursued, "it is impossible to inflict as much damage with a torpedo as with a ten or twelve-inch projectile launched from a battleship; and for two reasons, one being the greater difficulty of reaching the mark with a torpedo and the other being the greater certainty of a torpedo's destruction by a projectile hurled from a ten or twelve-inch gun."

"While also a torpedo may blow a hole in the side of a battleship if it has yet to prove its power to sink one whenever it strikes. In the much-contested torpedo

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FRANCES MARIE KNOWLTON, 680 Garfield Boulevard, Chicago, Ill., Age 4 Years. MISS LUCY MAT, 8035 Forestville Ave., CHICAGO.

LITTLE FRANCES MARIE KNOWLTON

whose photograph appears herewith has a most beautiful head of golden hair, thicker than the crown of glory of most mature women. Frances is only four years old, and her hair hangs within 12 inches of the floor. The extraordinary hair strengthening qualities of Dandierine has grown for this little girl the most admirable head of hair ever possessed by a child of her age in the world. The other two ladies whose photographs are shown here are certainly delighted with the results they are getting. Neither of them having hair that would reach to their waists before beginning the use of Dandierine.

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following year in France the thermometer rose to 115 degrees Fahrenheit. France also experienced two periods of great heat in 1706 and 1718. In the former year it was described as being "equal to that of a glass furnace." Meat could be prepared for the table merely by exposing it to the rays of the sun, and between noon and 4 o'clock in the afternoon it was certain death to venture out of doors. In the latter year it was so hot that many shops had to close and the theaters did not open for three months, while not a drop of rain fell during the double that period. Going back many centuries, one comes across years when great heat was experienced. In 1132 the Rhine dried up, as it was partially, together with the Danube, in 1301; and that it was more than warm in the Summer of 1123 is indicated by the statement that during that season eggs were cooked merely by being placed in the sand.

MALE FISH AS A "MOTHER" and the Young.

How the Bass Looks After the Eggs Evening Wisconsin. "The female fish has no maternal instincts whatever," said J. Nevin, of Madison, superintendent of the state fish hatcheries. "In fact, the fish is the most inhuman creature in existence—that is, of the animals which have any degree of intelligence at all.

"Perhaps it is well that it is so, for if the parent fish took care of their young as other creatures do, the waters of the earth would be filled with them in a very short time. Under natural conditions not one egg in a million ever becomes a fish a year old. As an example, I have seen female brook trout go up into the spawning places and spawn their eggs and then turn around and deliberately eat them.

"For the past few years I have been much interested in experimenting with bass and studying their ways. Here the male parent has some maternal instincts, apparently. He builds the 'nest' for the female, some little pocket with a gravel bottom protected from the strong current, but with plenty of fresh water, and then hugs or pushes the female into it. The eggs are spawned by the female, who swims away and leaves them to their fate. The male fertilizes the eggs and then for a few days watches over them, fanning them occasionally to insure a circulation of fresh water and keeping off other fish who would devour the eggs. The male fish have been known to follow the little fry for several days, protecting them until they were able to care for themselves.

"I have seen a school of say, 1500 bass fry devoured in five minutes by a few sun bass or perch, minnow. Under the care of the fish hatcheries from 50 to 95 per cent of the eggs become fish fry. How many of the fry live to be a year old or so after they are planted in the streams it is very hard to determine.

"Always tired" describes a dangerous condition. Hood's Sarsaparilla will give you strength.

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Extraordinary Facts About Hot Weather

Man Can Exist a Short Time at a Temperature of 200 Degrees Fahrenheit.

It may be taken as a general rule that human nature, especially in the British Isles, thinks the thermometer has gone quite high enough for it when it reaches 80 degrees Fahrenheit in the shade, while it has on three occasions exceeded that figure this month. Therefore, it is quite justifiable to look upon a temperature of 90 degrees as very hot. On August 15, 1893, the shade maximum in the afternoon was 95. This date, indeed, says the London Daily Mail, has been described as the hottest day of the 19th century, but the day really entitled to this proud position was July 25, 1855, when 162 degrees Fahrenheit was registered in the open air at a street level.

There are four other dates on which the next greatest amount of heat—suffocating and more than suffocating—has been registered in this country. On July 12, 1855, 155 degrees Fahrenheit was recorded, the previous day's reading having been 151.5; the 4th of the same month in the following year it was 151.7, and on August 14, 1857, it was 151.7 degrees. These facts and figures give some idea of what the sun is capable of. And of the terrible force of solar heat the astronomers have given a wondrous world as good a notion as can be conveyed by words.

For instance, Sir Robert Ball, who is at once our greatest astronomer and the most delightful of scientific lecturers, has stated that if the earth were likened to a grain of mustard seed the sun by the same comparison would be as large as a coconut, while the heat-giving power of a single square foot of its surface would be sufficient to place under the boilers of an Atlantic liner to enable her to break the record in crossing the "herring pond." If the sun's heat were maintained by earthly means, in doing so all the coal in existence would be consumed in a tenth part of a second.

Another famous astronomer in his day, the late Richard Anthony Proctor, explained the total heat of the sun in another way. According to him, it was equal to that which would result from burning something like 12,000,000,000 tons of coal per second, and its heat would be strong enough to melt not far short of 2,000,000,000 tons of iron in an hour. But of all its most incredible force of heat the earth receives but a small proportion—only about one in 2,000,000,000 of solar rays.

It has often been manifested, although no one has probably demonstrated it more clearly than did a Spaniard on June 24, 1817, that a great heat was created in 220 degrees Fahrenheit, and the man entered this inferno, where he remained for five minutes. On emerging

his pulse was found to be beating 200 times in 60 seconds, but a few minutes later he seemed none the worse for his experiment.

This was an extreme case, for a heat of 160 to 180 degrees Fahrenheit would appear to be the utmost that man can remain in for any length of time. In the case of the man who worked in the Cornstock silver mine in Nevada—the hottest mines in the world—are to be pitted. The shafts and galleries of these mines are over 250 miles in length, are more than 3000 feet deep, and at the 2750-foot level the temperature of the water is 123 degrees Fahrenheit and the air 128 degrees. In another shaft the temperature rises to 170 degrees, and it is only possible for men to work in it for or 15 minutes at a stretch.

There are other parts of the world, too, where the heat, even in the open air, is terrible. For instance, on the deck of a Persian Gulf steamer 120 degrees Fahrenheit has been recorded in the morning, while on the shore, at Muscat, a black bulb solar thermometer in the sun has registered 137 degrees. Great Britain has spent a week in recorded high record. The heat of the Summer of 1825 was so great that in some localities wheat and barley had to be pulled up by hand, being too short in the stalk to cut in the usual manner. The pastures were so burnt up that cattle had to be fed on sprouts of grass, sirrims dried up, and it was years later before many of them got their fish again.

In 1881 a disastrous heat wave was experienced in different parts of Europe. In Hyde Park the shade reading varied from 90 to 84 degrees; in Paris during a review scores of soldiers fell victims to sunstroke, while in Aldershot men dropped dead at drill. Two years later New York spent a week in dreadful heat; the city seemed as if it were on fire, 214 people being killed by sunstroke. Another great heat experience fell to the lot of the United States in July, 1876, especially in the Middle and Southern States. In Washington the heat was so intense that a prominent official declared the car rails became so expanded by the action of the sun as to be dangerous to the safety of the bolts. In 1881 again our Yankee cousins were stewing in the atmosphere of 106 degrees in the shade, and in the same year 101 degrees was reached in England.

And in times long gone by people grumbled at and enjoyed heat waves in much the same way as we do. That there are some scorching seasons a dip into the records amply testifies. For example, in 1880 so fearfully hot was it in Spain that the streets of Madrid and other cities were deserted, while laborers expired in the fields and the vines were scorched and spoiled. The Summer of 1772 was a dreadful one in New York, and it is related that the principal thoroughfares were battlefields in miniature; people were struck down by the score, no fewer than 100 cases of sunstroke occurring on July