# The Lurking Enemy Within Our Warships

What the Smokeless Powder Did to the "Liberte"—the French Warship After Being Blown Up by Its Own Ammunition.

## How the U. S. Government Keeps in Leash the Deadly Smokeless Powder That Menaces the Fleets.

WHEN the French warship La Liberte blew up the other day reducing the vessel to scrap iron and sending hundreds of the crew to eternity, the thought which occurred to everyone here, no doubt, was—may not the same catastrophe occur in our own navy?

The French disaster was caused by the decomposition of smokeless powder. In our naval service, smokeless powder is used now almost exclusively. Wherein then does our security lie?

On one of our modern Dreadnoughts two hundred and seventy-five tons of smokeless powder is stored—enough to blow up our entire navy if all our ships were concentrated at the point of explosion. But a disaster of this kind is impossible because of the rigid system of inspection prevailing in our navy. To understand the efficacy of this system, some idea of what smokeless powder is is necessary.

Smokeless powder is ordinary cotton soaked in nitric and sulphuric acids. The nitric acid makes chiefly for the study and inspection the cotton explosive; the sulphuric helps the nitric acid to combine with the cotton. When this has been accomplished, the cotton is squeezed under rollers and washed to get rid of the acids, emerging from the process as a soft white pulp resembling paper pulp. This is "guncotton." It is then dissolved in ether, and, on being dried, takes the form of a hard paste which is kneaded like dough and finally forced through perforated metal plates, thus assuming the shape of long rods. The rods are chopped up into short lengths, which are the "grains" of smokeless powder.

Smokeless powder is made in lots of 25,000 to 100,000 pounds. To each lot, when finished, an index number is given—for example, S. P. 758. After being dried for six months and chemically tested, it is sent to a naval magazine. There are a number of these magazines at various seaports. One of the biggest is near Norfolk. Such a magazine consists of a number of small buildings scattered over a considerable area, in which the powder is either made up into charges for guns of various sizes or else simply stored. If an explosion occurs, it can hardly involve more than one of the buildings.

When the powder is issued to a ship, a small sample of it is kept at the magazine, and another sample is retained at the powder factory. There is at Indian Head a well-equipped chemical laboratory, maintained chiefly for the study and inspection of smokeless powder.

The samples thus retained are kept under observation. When the powder is made up into charges and issued to the ship, an "observation sample" is issued with it, in a glass-stoppered bottle bearing the index number of the lot of powder which it represents. The sample is exposed to view in a rack in the ship's magazine, where it is subjected to the same conditions as the bulk of the same powder. It is examined every day.

In this way a watch is kept on every ounce of smokeless powder in the possession of the navy, whether on board of ships or in the magazines on shore. One young officer at the Navy Department in Washington is responsible for the condition of the powder on every vessel in the navy. If an explosion occurred in consequence of the decomposition of any of it, he would be held accountable. But he says that anxiety on the subject never costs him an hour's sleep.

If (as sometimes happens) one of the index samples shows signs of decomposition, immediate notification is sent to every ship or other place where powder of the same batch is in storage, in order that special attention may be paid to it. The symptoms are manifest enough. When smokeless powder decomposes, it gives out pungent, acrid fumes, red in color, so that one may see as well as smell them.

On board of every warship there is a fortnightly inspection of the powder, at which one or more charges of each index number are opened upand examined—the stuff, that is to say, which has been packed in bags for the guns. In addition, there is a monthly test, at which, sample charges being broken open, a small quantity from each is taken out and put into a bottle that has been chemically cleaned. In this bottle is suspended a strip of blue litmus paper that has been dipped into distilled water. If nitric acid fumes are present, they will turn the paper red.

Should such a thing happen (as it sometimes does), the powder of that batch is put under a "surveillance test." That is to say, a small quantity of it is placed in an oven and heated to a certain temperature. If it endures this treatment for sixty days without giving out any fumes, it is in perfect condition. If it stands for forty days, it is good powder. If it is all right for twenty days, it is safe to keep and use. But, if in less than twenty days it gives out fumes, it is put ashore and shipped to the nearest naval magazine, where it is kept for a while and watched.

Meanwhile samples of it are tested in a chemical laboratory on shore, and, if the powder is found to be really bad, it is sent to the factory at Indian Head and "reworked." In other words, it is ground up and reduced to the shape of fresh raw material—a new batch of guncotton for conversion into smokeless powder.

The Nitrating House, Where Cotton Becomes Explosive.

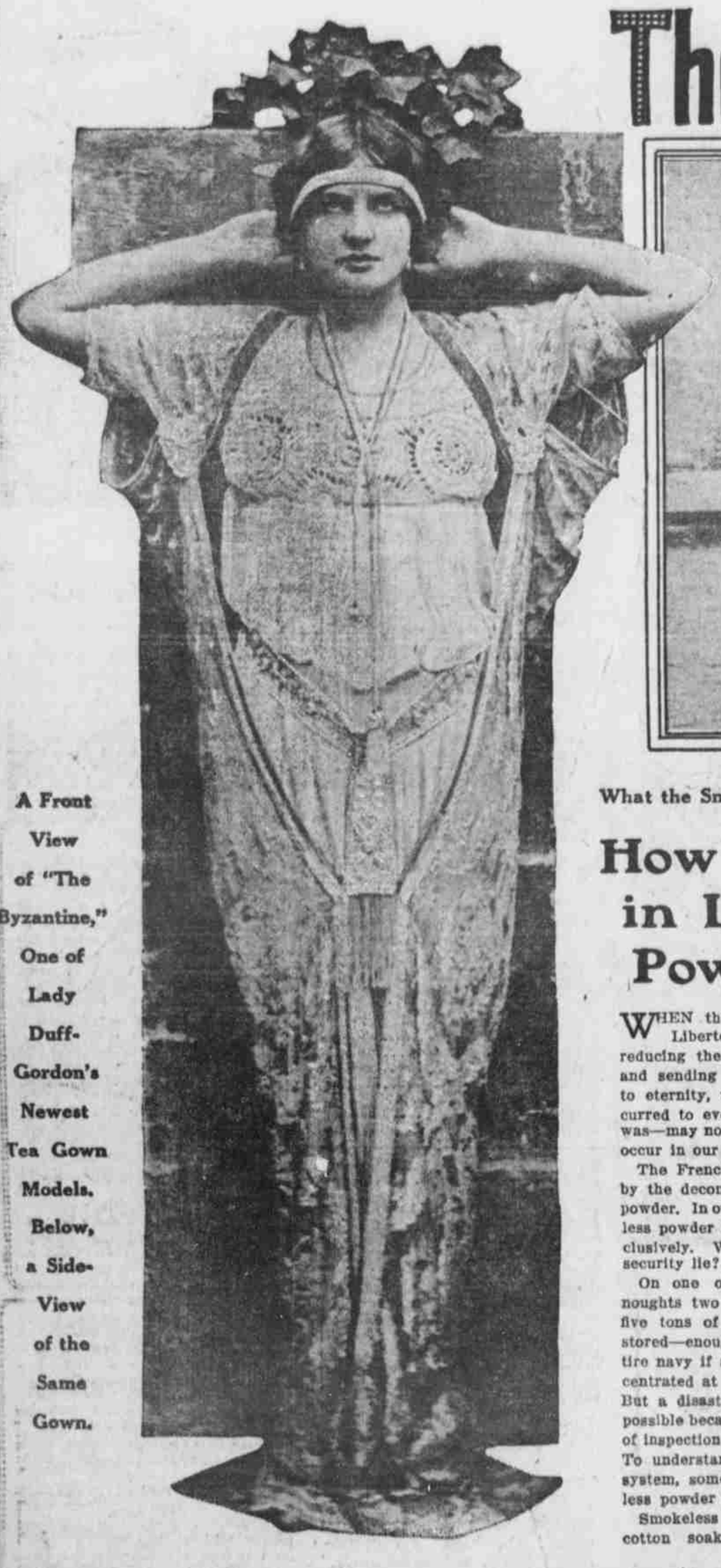
After Cotton Is Nitrated It Is Steamed for Two Days.

Cutting Powder Into Strips.

Drying—the Last Stage.

Where the Smokeless Powder Is Pressed Into Discs.

The Finished Product Ready for the Guns.



A Front View of "The Byzantine," One of Lady Duff-Gordon's Newest Tea Gown Models. Below, a Side-View of the Same Gown.

## "The Byzantine"



*LADY DUFF-GORDON, the famous "Lucile" of London, and foremost creator of fashions in the world, writes each week the fashion article for this newspaper, presenting all that is newest and best in styles for well-dressed women.*

*Lady Duff-Gordon's new Paris establishment brings her into close touch with that centre of fashion.*

*Lady Duff-Gordon's American establishment is at No. 17 West Thirty-sixth street, New York.*

### By Lady Duff Gordon ("Lucile.")

HERE is my ideal tea-gown. I call it the "Byzantine" because it reminds me of the colorful conception of that ancient empire. It consits of a clinging softness of white chiffon just faintly flushed with the flesh pink of the ninon underrobe, and arranged with a breastplate of silver and a sky-blue girdle wrought with traceries of silver and massed with pearls, both the pearls and the silver being brought together again in the bordering fringe.

At the hem of the skirt the silver-mesh lace is used as a border, and then, over all, comes a coat of sea-green ninon brocaded with silver and with an edging, too, of silver tissue and more deeply green velvet to follow and accentuate its lines of grace.

Leaf-shaped silver ornaments serve as fastening for the sleeve draperies, and catch the coat together, too, in front, beneath the girdle fringe, and, finally, to give form, as well as finish, to the slight square train, the semi-transparent shimmering fabric is deeply edged with velvet.

There is something in the combination of colors represented in this gown which to me gives it the "Byzantine" effect. It is a creation which will lend charm to almost any woman, although, of course, its cost would make it prohibitive to many.