

own Governments. If this course has been pursued in any case the success of the spies has not been flattering. In a recent number of the London *Artizan* we notice elaborate copper plate engravings which purport to be plans of the monitor turrets. They are incorrect in so many respects that they cannot be criticized; they bear not the most remote resemblance to the monitor turrets and their fixtures, except that they are round. To crown all, but one gun is shown in the turrets. If no better than this can be done we may as well open the doors at once and give every one free access to our ships-of-war.

SUBMARINE WARFARE.

We have from time to time chronicled the attempts of the Confederates to blow up our vessels-of-war with submarine torpedoes. Some of these efforts have been successful, while others have failed. The *Ironsides* was attacked off Charleston, but suffered little damage; while the *Housatonic*, a wooden ship, or sloop-of-war, was sunk by one of those machines. The close professional observer must have remarked the similarity which exists between the boats or whatever the craft is which conveyed the torpedoes to the vessels attacked. They are all mentioned in the reports as long and low, and almost indistinguishable; the time of attack is generally at night, when darkness is likely to favor the operation. The last assault of this kind was made upon the *Minnesota*; and the results are thus related by a correspondent of the Philadelphia *Inquirer*:—

About 1:50 A. M. a boat was hailed by the sentry on post on the port gangway, but not receiving any answer, he fired several times at her. This did not have the effect of receiving any answer, when the officers of the deck hailed her and she answered *Roanoke*. She was then ordered off, or else she would be fired into. This warning she did not heed, for immediately she ran into our port beam, and at the same instant she exploded a torpedo, giving a great shock to the ship, and doing a great deal of damage. One of the forward guns was immediately trained upon her; but it did not check her speed. Several tug-boats were despatched after her, but they did not succeed in finding her. The damage done to the ship was somewhat serious. The deck and walls of the engineers' steeerage were badly torn up. The paymaster's storeroom was also badly damaged. The shell room appeared as one mass of ruins, owing to the displacement of the shells. The shaft alley of the propeller was crushed in, and prevented the working of the machinery. Several guns were lifted from their positions and thrown against the ports, crushing them completely. The steamer which caused this excitement was of small dimensions, and was a propeller. She did not appear to be a steamer excepting the smoke-stack. The only time that she showed signs of life was when she was retreating, when she commenced to fire up and raise steam. She was capable of containing but a few men.

Another writer says:—

It seems exceedingly strange that the mysterious craft could come down the river past all the picket boats, and not be observed until almost alongside the flag-ship, which lay nearer the mouth of the river than any other vessel of the fleet. Where she came from is not known; but it is surmised that she ran out of the Chuckatuck. She must have been propelled by muffled oars as she neared the flag-ship; but as soon as the torpedo was attached she steamed rapidly away. The report made by the explosion was very heavy. It was heard very distinctly at Fortress Monroe. The torpedo was placed amidship, and was not properly adjusted. Had it been rightly fixed to the vessel, there can be no doubt that it would have been blown to atoms, and the hundreds of unconscious sleeping men hurled into eternity without the least warning.

It was stated at the time of the attack on the *Ironsides*, that the torpedo-boat went to the bottom; but this does not appear to have been any particular loss to the enemy, as the craft which assailed the *Minnesota* is evidently of the same construction. It is very plain that threats do not frighten these adventurers, and if the officer-of-the-deck on the *Minnesota* had fired into the rebel craft without ceremony, instead of parleying, he might have sent her to the bottom.

It will not do to dismiss this attack as a mere matter of chance. They are not chances; they are deliberate and well-organized schemes to blow up our large frigates. Having no ships of their own to lose in this way, the Confederates are perfectly secure in attacking ours; and they have shown that a submarine boat may be constructed which will, to all intents and purposes, destroy the finest vessel that floats. A little more practice will make them perfect, and the next attempt may be more successful. One remedy against disaster from this source appears to lie in providing booms, or out-riggers, armed with cables or chains that cannot be severed by a blow from a cutlass. These, extending at a distance of

twenty feet or more, will prevent the torpedo-boat from approaching too near. Firing at these adventurers with muskets is rather uncertain work, and if no means can be provided to keep them off, the navy will have to record the loss of some of its finest ships, for the rebels have come too near success to be satisfied with anything less. However we may despise rebels as public enemies it is poor policy to underrate their capacity for mischief. If they do not move armies in heavy battalions against us, they are incessantly at work with bands of marauders. If they have no iron-clads or frigates fit to cope with ours, they have submarine boats which they use with great effect, as the results of their expeditions show. When the enemy plots, we must counterplot; and it would seem not impracticable or a waste of time for naval commanders to exercise more vigilance, and frustrate the attempts of the rebels before serious loss occurs to the navy.

NEW MODE OF SMELTING LEAD ORES.

Prof. A. H. Everett, of this city, has just brought to perfection a very neat improvement in the reduction of lead from galena, by which a considerable saving in expense is effected. One of the common methods of reducing this ore is to mix it with iron in a reverberatory furnace; the sulphur at a high temperature, having a stronger affinity for iron than for lead, leaves the lead and combines with the iron, forming sulphide of iron, while the lead is drawn off as a separate metal.

At the present time, however, the high price of even iron scraps (about \$40 per ton) induced Prof. Everett to look about for some substitute, and it occurred to him to try the waste tin scraps of the tin plate-workers; in these he has the very best of wrought iron, and in a form exposing the largest surface for the action of the sulphur. The tin scraps, being a waste product, can be had at a nominal cost.

After a series of experiments the practical difficulties of the new process were overcome, and now several tons of ore are being smelted by it daily at Prof. Everett's furnace, at the foot of Horatio street in this city.

The operation is extremely simple. Five hundred pounds of the sulphide of lead are mixed with 125 lbs. of tin scraps in a reverberatory furnace, and kept at an intense heat; the charge being stirred every 15 minutes. In from one to two hours the whole mass becomes fluid, and the reduction is complete. It is found best to introduce one half the charge of tin scraps, and allow it to become red hot, when the ore and the remainder of the scraps are added.

Besides the cheaper and more rapid reduction of the ore by this process, the tin of the scraps is mixed with the lead, increasing the yield, and for many purposes improving the quality. Prof. Everett has secured a patent for this valuable invention.

New Uses of Iodine.

From the specification, recently issued, of a patent by Professor Hofmann, of London, we learn that a new coloring matter, which dyes silk and wool of a beautiful violet, blue violet, or red violet tint, has been produced by the application of iodine extracted from sea-weed. It has long been thought that if iodine could be used as a coloring substance it would be one of the most powerful known. The patented process consists of mixing in certain proportion the substance called rosaniline with the iodides of ethyl, methyl, or amyl. This dye may be used in the same manner as the aniline colors, and is already in the hands of practical people in all the manufacturing districts, and bids fair to be the "color" of the season. The use of iodine as a disinfectant has also been noticed by Dr. Richardson, who states that iodine, placed in a small box with a perforated lid, is a good means of destroying organic poison in rooms. During the late epidemic of small-pox in London, he has seen the method used with benefit.

THE "RE DE ITALIA."—The American iron-clad, *Re de Italia*, has arrived safely at Naples. She made an excellent passage; her time was 18 days and 18 hours. Nothing further has been heard from the *Galanuomo*, which went out with the iron-clad to see her safely over. A full description of the *Re de Italia* will be found in back numbers of the current volume.

DEATH OF A DISTINGUISHED INVENTOR.

Mr. Thomas Blanchard died at his residence, No. 109 Tremont street, Boston, on the 16th instant, of apoplexy. He was nearly seventy-five years of age. Mr. Blanchard was one of the most celebrated of American inventors, and his lathes for turning irregular forms such as musket stocks, also the arrangement for turning the octagon at the breach of the barrel are widely known, and have contributed largely toward perfecting the weapon and facilitating its manufacture. Mr. Blanchard was also the inventor and proprietor of a machine for bending timber, one for making envelopes, and another for mortising holes. The number of his mechanical inspirations is very great, and for 50 years he has given them to the world in various forms. We little thought when making some account of his lathe for turning irregular forms on page 264 of the present volume of the *SCIENTIFIC AMERICAN*, that we should so soon be called upon to chronicle his death. Mr. Blanchard was married recently, and we met him and his young bride in Washington. It is singular that two great inventors should have passed away at nearly the same time. Mr. Richard Roberts, an Englishman, the inventor of the iron-planing machine and others, recently died in England, and his loss is accounted a great calamity.

Lord Rosse, the Irish Mechanist.

The Earl of Rosse is the "Tubal Cain" of the Irish peerage—a noble Vulcan, a smith and an astronomer equally at home in the forge or among the stars. Most people have heard of his lordship, or if they have not heard of his lordship, they have heard of his great telescope, fifty-three feet long and six feet in diameter, through which the celebrated nebulae of Sir John Herschel was first seen in its most distant aspect of a myriad of clustering stars; and last summer it was asserted that his lordship had an early private view, through the same monster instrument, of the approach of the hot weather, and was thereby enabled to erect sheds for his cattle. The great telescope stands in the middle of the demesne, and is slung between massive stone walls something like a pier of the suspension bridge, without the arch connecting the side masonry.

The first thing that strikes you, is that it is like a gigantic piece of wooded ordnance, being put together with tremendous staves like a cask. The instrument is pointed at a given angle towards the heavens and down in the bottom of the huge cylinder, or cask, if you choose to call it such, is the speculum or reflector, the largest that has ever been made, and the manufacture of which, under his own superintendence, was the triumph of Lord Rosse's mechanical powers. In this metallic mirror is reflected the heavenly body under observation, and on a stage near the opening at the top stands the observer, examining at leisure planet, fixed star, meteor, or nebulae, just as the case may be. Here pigmy man reviews the heavenly host, but Lord Rosse is no pigmy. If his father had worn a blacksmith's apron instead of ermine or sables, the son would have risen from the cinders of the forge to be a Stephenson or a Herschel.

The Earl's residence, Rosse's Castle, is a most amusing mixture of the forge and the feudal fortress. The greater part of the structure is comparatively new, but portions of the old castle, which in the Jacobin wars stood a brief siege, still remain, and bear upon them the traces of cannon balls. The present nobleman has surrounded the building with a rampart and fosse so that in a sudden emergency it might be turned to strategical account. Fortification is one of the many branches of knowledge to which he has turned his thought; but when you get within the line of defense, what a contrast to baronial or military force the objects that meet your eye afford! The genius of Watt triumphs over the imitations of Vauban.

Where cannon might have bristled a tidy steam engine worked; great lathes turned under the towers that frowned defiance at James's force; in the stable, where racing stud or war steeds might have been sheltered, an ingenious and powerful apparatus for polishing the great speculum was fixed; in the corner of the castle yard was a furnace, and close by stood the moulds in which the monster was cast by his lordship, with face and hands begrimed with sweat and coal dust—an event more important, but not as worthily recorded, as the casting of Schiller's bell. Scraps of iron and smith's coal strewn the ground; and, instead of the