

PRUSSIAN SIEGE OPERATIONS.

(From the London Engineer, Sept. 12, 1873.)

The siege operations conducted by the Prussian army have this autumn attracted attention in an unusual degree. They were carried on in this year—and will, we believe, continue to be carried on for some years to come—against a face of the fortress of Grandenz, which may be seen on any good map on the right bank of the Vistula. The numbers of men employed this year were nearly as follows: Sappers and miners, 4,420, and infantry, 1,560, besides four batteries of artillery of four guns each. It follows, therefore, that there was much work indicated instead of being carried out, and it required a good professional knowledge of the subject to form any judgment on many parts of the programme. The engineering feature which had attracted most attention in England, and promised to be most interesting, was the mining, it having been believed that experiments on a large scale, with various explosive compounds, would be carried out. Dynamite was actually used, but no gun cotton. The artillery of Prussia is not generally considered to be as good in the same striking degree as the rest of the army, nevertheless there is one branch of fire in which we gave it as our opinion, in the *Engineer* of November 20 last, that they were pre-eminently, that is vertical and curved fire. Counterscarps and concealed batteries have long been prominent features in Prussian systems of fortifications; it is not, therefore, surprising that in works specially inviting the powers of curved fire, the latter should have become well developed. Good results of this action of fire we hoped to hear of at the German siege operations, nor were we disappointed. The same cutting down of hidden walls in deep ditches that we read of in the siege of Strasburg was here to be seen under conditions allowing of the scrutiny of all present. One or two points not formerly understood in this country may be noticed. The guns are repeatedly fired in the same direction by means of graduated scales across the front and rear portions of the carriage, which admit of the gun being on each occasion laid at the same angle to the direction of the platform as before, or with any desired correction. In fact, there is an improved application of the plan of laying by battens and chalk. The tangent scale provides for the desired elevation. The most important point, however, is the existence of a lookout-man, placed where he can see the wall which is being destroyed, and signal to the battery so as to correct their aim after each round, which he does with a flag on much the same system as that used by the markers at our rifle butts. At first sight this seems a means of assisting a battery that could seldom be adopted on service. Practically, however, this is said to be to a great extent feasible, although the service is, as we are informed one of extreme peril. The value of life however, does not appear to be rated so high, even in peace times, in Germany as in England. We are not now speaking of the necessary sacrifice of life for a great end, but of the waste of it through neglect of wise, though often, no doubt, tedious precautions. Any one who has had much to say to powder work knows the surprise with which foreign officers generally, as a class, receive and conform to the directions which are so rigidly enforced on any one entering our government cartridge and powder factories. The remembrance of this comes painfully upon us in connection with

the Prussian autumn siege operations, because of the startling fact, the last we now propose to notice, that during the course of them no less than ten men were killed. It is easy to conceive of some single accident causing loss of lives, as may happen any day from the bursting of a boiler in a factory; but in this case the loss of life was not caused by a single accident, nor was it due to the action of any power ordinarily beyond control, or of a new and unsuspected character.

Captain Kutzbach, of the Prussian Engineers, who has visited this country, and is well known by reputation, was the officer directly superintending most of the mining operations. After the springing of a mine charged with dynamite, he pressed forward to the seat of action assured of safety to some extent, as he considered, by the existence of a shaft in the vicinity. With such precipitation did he advance, that himself and six of his men sank overpowered by inhaling the gas produced by the explosion, and were only withdrawn with life extinct. That an officer should be allowed to follow instincts of his enthusiasm unfettered by the rigid regulations drawn up by older and cooler heads, may well be a matter of not only regret, but also of surprise. But what shall be said to the fact of three men on another occasion losing their lives from the bursting of hand grenades? That it is a service of danger to throw these missiles by hand is undoubted. An English artillery non-commissioned officer, who had thrown large numbers from the head of a sap in our New Zealand war, used to be regarded with deserved respect for the feat, and we do not know whether even he gave them the three regulation waves of the arm to insure the fuse burning so far as to preclude the possibility of the enemy picking them up and throwing them back before they burst. Recognized as a dangerous performance, the manipulation of hand grenades has been attended with caution. It is even said, on one expedition, that they were found most effectively fused, but with no powder in them, for if filled they were frequently thrown without lighting the fuse; while on the other hand, their sizzling was sufficient to frighten the enemy, even although a little experience would have taught him that they did not burst. Without indorsing this tale, which we trust is a libel against the armies in question, we cannot but condemn the method of using them in mock siege operations, especially with fuzes so unusually bad as these in question, appear to have been. The fate of a good soldier killed by throwing a bad hand grenade at an imaginary enemy is surely one to be lamented. As regards the death of Capt. Kutzbach and his men, the question may concern civil engineers as nearly as military ones. Was the gas that killed him ordinary carbonic acid, or was it what may be termed nitro-glycerine gas? We fear it may be difficult now to determine this question, but it may indicate the desirability of a little more experiment as to the products of the explosion of nitro-glycerine compounds, and the circumstances insuring their complete combustion, and safely in approaching the spot afterwards.

The German admiralty has ordered a squadron of three iron clad frigates and one advice-boat to be formed next year, and the ships are to be in commission for four months. Besides this a gunboat flotilla, consisting of two first-class gunboats, to manœuvre on the coasts, is to be formed next year. A sloop-of-war is to be sent next year to observe the transit of Venus.

A NEW LIFE SHIP.

An event came off recently at Southhampton, England, which we should fain hope was full of the promise of greater safety for the sailors of the world, and, indeed, for all who 'go down to the sea in ships.' 'Every one is familiar,' says the *London Daily Telegraph*, 'with the life-boat, and with the admirable institution by means of which its benefits are diffused over the whole coast, and are proud of the fact that it is in main an English institution. That since the establishment of the Life boat Institution in 1824 down to 1872, upward of 21,000 human beings have been rescued from death chiefly by it means is a great fact, greater than the most brilliant victory ever obtained in war, even although that one victory should have destroyed double the number of lives which it took the life-boat half a century to save. There is no need, therefore, to argue the merits of the life-boat; but with all its valuable qualities the life-boat could not meet every contingency of shipwreck. When the storm-tossed vessel was seen approaching the fatal shore, the life-boat would at once be launched and pulled by the brave crew towards the point of danger; but to make headway against the breakers was a task beyond human strength, so much so that sixteen strong rowers could frequently make no more than a mile an hour, while the doomed ship was perhaps driving to her destruction at almost a mile a minute. To meet this hard but not unfrequent contingency, Capt. Hans Busk has had built a little sea-going vessel, to be called a life ship, and the mission of which will be to cruise up and down the English Channel in all weathers, bringing succor to ships when approaching a lee shore, from the windward side. The idea is a bold one, as a benevolent, it is full of difficulties; but are not difficulties things to be overcome? The vessel, which was launched under the happiest auspices, is about seventy tons burthen, was designed by Capt. Busk in the finest life-boat lines and with a springing deck, such as is found in the Dutch galliots, which are the finest sea-boats (for safety) in the world. She is as strong as wood and iron can make her, her planking, being arranged on the diagonal principle, and all her internal arrangements contrived in entire subservience to her mission. She will be furnished with steam-engines of seventy-horse power, and to obtain funds for the purchase of these indispensable steam-engines is the object with which Capt. Busk and his philanthropic condutors now appeal to the mariners of all nations.' Capt. Busk, a yachtsman of many years experience, and who has himself designed numerous vessels of the most superior weathery qualities, is full of confidence that the life ship, when complete and furnished with engines of sufficient power, will be able to keep the sea, bear down from the windward upon vessels approaching a lee shore, and in the worst cases take the crew off in life-boats, two of which she will carry on her deck. That the object is one worthy of public support is proved by the influential names to be found on the Committee of Management, by the liberality of some of the contributors already received, and by the substantial tokens of sympathy which the project has received from people in business more or less connected with the shipping interest.'