LAY ME LOW.

Lay me low, my work is done;
I am weary. Lay me low,
Where the wild flowers woos the sun;
Where the balmy breezes blow,
Where the butterfly takes wing,
Where the aspens drooping grow,
Where the young birds chirp and sing,
I am weary, let me go.

I have striven hard and long
In the world's unequal fight,
Always to resist the wrong,
Always to maintain the right;
Always with a stubborn heart,
Taking, giving blow for blow,
Brother, I have played my part,
And am weary, let me go.

Stern the world and bitter cold,
Irksome, painful to endure;
Every where a love of gold,
Nowhere pity for the poor.
Everywhere mistrust, disguise,
Pride, hypocrisy and show.
Draw the curtain, close mine eyes,
I am weary, let me go.

Others' chance, when I am gone,
May restore the battle cail;
Bravely lead a good cause on,
Fighting in the which I fall.
God may quicken some true soul
Here to take my place below
In the heros' muster-roll.
I am weary, let me go.

Shield and buckler, hang them up,
Drape the Standard on the wall,
I have drained the mortal cup
To the finish, dregs and all.
When our work is done 'tis best,
Brother, best that we should go,
I am weary, let me rest,
I am weary, lay me low.

ELECTRIC TORPEDOES.

(Continued from page 255.)

The following points may be enumerated as the essential conditions of a torpedo system of Defence:—First, the torpedoes in themselves must be non-explosive and harmless, not liable to accidental discharge by percussion or carelessness. Second, the power of testing at all times the submarine or land circuits of the torpedoes without danger of explosion, and of speaking and telegraphing information and instructions through the charge without risk. Third, the power of igniting the mines at will, and of discharging several torpedoes in group with a single wire at distances exceeding that of the effective range of artillery, and that the explosions shall only take lace when the vessel or vessels to be destroyed are within the area of destruction. Fourth, the power of discharging the mines, even should the enemy succeed in breaking one of the conducting wires, and of preventing the explosion of the mine by the enemy. Every torpedo in its complete form consists of three parts; the igniter, the charge, and the torpedo case or tank, with the necessary internal and external arrangement of electric connections and conductors giving the operator the entire control of the mine. The destructive power of both the land and sea torpedo will of necessity depend upon the amount of powder or charge placed within the mine, the conditions of the attack, the effect to be produced, and proper attention to the various important details connected with the electric circuits, laying down, testing, and ignition of the mine. When the necessary precautions are observed in connection with these details, all danger of involuntary explosion is removed, and accidents become impossible even in the hands of inexperienced officers. The power of testing the effective condition of the circuits and connections within the torpedoes, and of speaking through the mines without danger of ignition, so as to maintain telegraphic communications between the several outlaying stations and the centre of action, constitutes one of the main features of the Holmes and Maury system, developed by them in 1863 during the civil war in America.

The experience of the victories by the Prussian armies in Bohemia points to the great importance of maintaining telegraphic communication between the outposts, stations, and outlaying divisions of the army in regulating the successful issue of their military manœuvres, and the same rule applies equally to naval tactics. For instance, let it be supposed that the enemy's fleet is advancing up channel; with this system orders could be immediately transmitted from A station to B station, directing attention to such and such a group of mines under certain instructions to be given during the progress of the attack or the emergencies of the moment; and the transmission of such intelliffence, while it places the whole field under the control of the commanding officers, at the same time points out the integrity of the several electric circuits The recent Franco-Prussian war likewise affords a very instructive example, illustrative of the inefficiency of a divided attack or defence in the absence of special telegraphic communication. The well appointed and expensively maintained French naval force sent to the Baltic to carry out concerted operations by land and sea, to effect a diversion in favor of a land attack upon the enemy, was practically useless and inoperative from the absence of telegraphic communication from head quarters directing the manœuvres and organizing the diversion. Thus a most valuable opportunity for an effective land attack along the Prussian frontier, coincident with a naval engagement off the southern shore of the Baltic, of immense importance to France at that critical time, was absolutely and entirely lost, and all joint and reciprocal action between the French army and naval forces completely frustrated.

The ignition of the electrical mine has next to be considered. The importance of accuracy and precision of ignition at sea will be understood by calculating the length of time the enemy remains in the line of vision. A vessel steaming, say, at the rate of nine knots an hour, will move through the water at the rate of 18ft per second, and supposing her length to be 300 ft. she will remain in position to receive the effects of the blow only sixteen seconds, scarcely a quarter of a minute. The condition under which the defence is established also requires consideration. If by sea, the nature of the bottom on or over which the mines are to be placed, the depth of water, the set of the tides and currents, and the strategical positions to be defended. If by land, the probable nature of the enemy's attack and advance requires consideration, and the successive positions to be maintained. Hence, in every system of electric defence the attention and consideration, of the torpedo engineer should first be directed to obtain an accurate knowledge of the ground, whether rock, sand, or mud, the currents, depth of water, and rise and fall of the tide over the area in which it is intended to carry out a torpedo system. The importance of ascertaining the nature of the bottom is at once apparent, for, if found to be rocky, special arrangements must be carried out to secure the immovability of the mine in the position originally assigned to it, any deviation by reason of currents dragging over the bottom being absolutely fatal to the effective discharge of the mine for destructive purposes. Again if the bottom is sandy, then careful investigation requires to be made as to the stability of the sand; should it prove to be of a shifting nature, every precaution must be taken to properly calculate the strength of the conductors so as to prevent breakage by undue pressure, either by the wires being silted over, or by being underswept by the action of the current and exposed to an unequal strain. Again, if the bed of the ocean or river should prove to be of a yielding nature, such as mud, the mine might become buried, and the calculations as regards the effective force of the explosion be materially diminished in relation to the column of water between the mine and the object of attack.

It must be borne in mind that these points are essential in every system, as torpedo mines may be months submerged before called into action Such was the case with the James river mine, which lay thirteen months in the bed of the river before called upon to display its destructive properties. Again, a careful estimate of the strength and direction of the surface currents and tides is equally essential, because in charging a mine calculation has to be made for the swiftness of the motion of the vessel. When only seconds are allowed for the "effective shot," it is certainly a matter of moment for the operator to be well informed of her velocity, moving either with or against stream. The utmost nicety of calculation and manipulation is required to insure an accurate and decisive explosion. With the gun the action of the wind upon the flight of the projectile in relation to the strength of the charge enters into the elements of the calculation. With the torpedo engineer, the velocity of the current and the depth or cushion of water form an equally important feature in the effective manipulation of the mine. The depth at which torpedo mines are submerged below the surface is again of vast moment in relation to the strength of the charge and bursting power of the case. water being for all practical purposes considered as incompressible in every direction, it becomes evident that the effective action of the torpedo mine will always be that of the path of least resistance, or, in other words, in a vertical direction; but it does not always follow that this is practically the case, should the power of the charge and the *vis inertia* of the resistance be improperly calculated. It is on record that Admiral Chabannes, when trying some experiments with submerged electrical mines from the jetty at Toulon, found that the effective force of the mine was conveyed along the bed of the ocean, and the force of the explosion being thus transferred to the piles of the jetty, the operating party on the pier were knocked down, or rather hoisted by their own petard, while the surface of the ocean and the "area of destruction" over the mine remained perfectly tranquil and powerless to destroy the enemy supposed to be in position over it. In this instance the strength of the charge in relation to the depth of water or resistance to be overcome had been miscalculated in relation to the conducting or vibrating power of the bed of the sea upon which the mine was placed, its distance from the piles of the jetty had not been properly considered, In fact, the depth of water being too great for the charge, and the resistance of the intervening ground between the mine and the jetty being less, the effective power of the mine, taking the path of least resistance, found vent for its energy through the vibratory motion it communicated to