

proaching crisis as a very grave one. It is impossible to compete with the magnitude of continental armies, yet it must not be forgotten that the disparity of force, *ceteris paribus*, is not greater than it was in the time when the power of Napoleon the First was at its zenith. During the war of 1870, the French at an auspicious moment paid us the handsome compliment of wishing for a force of only 20,000 British troops to turn the tide of battle and rescue Paris. And who shall say what a similar force might not accomplish in circumstances easily conceivable, with our fleet in command of the seas? This latter, indeed, is the vital point; and in concluding its remarkable article by expressions of reliance on our Navy, the *Times* is only echoing the tenor of much that was written in the columns of the *Broad Arrow* during the progress of the Franco-German war. For ourselves, England is but a vast fortified capital, the defences of which are the cliffs and seas, which serve as rampart and moat. For our continental allies, the offensive power of our fleet, with the ability and constant readiness to throw a small and thoroughly efficient force on a given point at a given moment must constitute our claim to their confidence. If we do this in the future, as we have done in the past, we are persuaded that no Power which throws its sword into the scale with that of England will have reason to reflect that it trusted too much to the endurance of our gallant troops or the efficiency of our naval power. In these columns we have consistently advocated the frank acceptance of the "invariable," and the arrangement of other conditions accordingly. It is neither for the interest of the country nor that of the Service itself, that we should adopt such extraordinary means as the conscription to increase our military strength. We depend upon our gallant little Army to do its part, if ever called upon, even in a continental struggle; but if the day should ever arrive when the Navy is too weak to command respect for our flag, there will be no need to wish "more men from England" in a foreign battle-field.

The Channel Tunnel.

The *Times* says now that the scheme which has so long been shadowy to the general public is at last about to pass into the region of actual experiment, we naturally pause and ask ourselves how far we are in a position to forecast its prospects. The two main questions are whether it can be done, and, if it can be done, whether it will prove to have been worth doing. The practicability and safety of submarine horizontal driftways have been shown, it is argued, by submarine mines. The levels of some Cornish mines are 700 yards or more under sea; at Whitehaven, some submarine workings run three miles in a straight line, and, with connecting branches, form more than 100 miles of galleries below low water mark. As to the danger of a large water yield from the strata to be worked, the conclusion reached by Mr. Philips in 1818 has been confirmed by latter results—that the Straits of Dover were formed by the gradual erosion of an isthmus, not by a convulsion; and, if this view is right, the scope of the danger is presumably limited to the water-yield from gray chalk. Here we are reassured by the result of Mr. Prestwich's well known experiments, which have proved that chalk absorbs freely, but yields slowly. As regards the time and the cost, the experience derived from similar works is our best guide. Even assuming

that the labour is to be manual labour, and taking as precedents the gallery driven from the Castle wall at Dover or the Water-works at Grays, in Essex, we got only nine and a quarter years for the Channel Tunnel; but Mr. Brunton's tunnelling machine, working day and night through grey chalk, would complete a driftway of seven feet diameter in one year. For an estimate of cost the linear yard is the best unit, and it may be borne in mind that £25 per linear yard would be about one million sterling for the whole Tunnel. The three most costly Tunnels in England have been those of Kilaby, Saltwood, and Bletchley. The Kilaby rate of £145 per yard would give us £5,646,620 for the Channel Tunnel; the Saltwood rate of £118 would give £4,568,960; the Bletchley rate of £72 would give £2,787,840. In France the most costly tunnel—that of Batignolles, on the Chemin de Fer de l'Ouest—cost £95 per yard; the cheapest—that of Terre Noire, on the Paris and Lyons Railway—cost £30. The Mont Cenis Tunnel cost £195 per yard; and this rate would give us for the Channel Tunnel £7,450,400. On the whole, ten millions sterling ought, so far as we can judge at present, to leave a safe margin. But suppose the Tunnel made—will it pay? Experience shows that any breach of continuity hinders the flow of traffic, and it is principally on this ground that break of railway gauge has been found to work so ill. The Channel passage is at present a breach of continuity in the journey from London to Paris. With that drawback it is reckoned that, at the present percentage of increase, the number of passengers between Dover, Folkstone, Newhaven, and Calais, Boulogne, Dieppe, will, for this year 1880, amount to 600,000. A direct railway would, it is thought, quadruple this; but suppose that it doubled it; this, at a mean rate of 7s 6d would pay £375,000. Including goods traffic of all kinds, and the use of the Tunnel for telegraph lines, the gross revenue would, it is estimated, be about £850,000. On the other hand considering the large protection of the Tunnel from changes of weather or temperature, the absence of intermediate stations and of unremunerative branch lines, the working expenses would be covered, it is said, by 35 per cent. instead of the ordinary 45 per cent. of gross revenue, leaving upwards of half a million for dividend. These are the arguments and calculations of hopeful promoters; and we lay them for what they are worth before our readers, who, if the Tunnel is ever opened for traffic, will see them justified or corrected by the event. One consideration ought not to be left out of sight—that a large class of passenger traffic will probably be affected for a long time, if not permanently, by the special risks, real or fancied, of a transit under the sea, and that a single submarine accident would indefinitely increase these apprehensions. In the case of the Mont Cenis Tunnel or the Suez Canal, to achieve was to succeed; in the case of a channel tunnel, science challenges the popular faith in her power not merely to achieve but to protect; and at present well wishers can but hope that her resources will prove equal to both demands. It is just a quarter of a century since Robert Stephenson put the last rivet in the great tube of iron which he had thrown across the Menai Strait. It may be that the year 1875 will be remembered hereafter as that which the first active step towards an effort of engineering skill which was for the second half of the nineteenth century what the Britannia Bridge was for the first, and which, linking the shores of a broader

strait than that which parts Anglesey from Carnarvon, joined not two counties, but two nations by a work in which they were fellow-labourers.

A MEMORABLE ANNIVERSARY.—The 87th Regiment, stationed at the Citadel, will this evening commemorate the battle of Barossa, fought March 5th, 1811, which added to their colors one of the many glorious names which cluster around them. At this battle of the Peninsular war, the French force was numerically double that of the English. The regiments of the former were the flower of the army, and had received honorary distinctions from the Emperor Napoleon in honor of their previous services and gallantry. General Graham was in command of the allied forces, which had not even the advantage of experience in the field. The position of the English, too, was seriously disadvantageous; the enemy having been able to choose his own ground, which, it happened, had been that which Graham had selected for himself. The fight of Barossa was short, for it lasted only one hour and a half, but it was violent and bloody. Fifty officers, six sergeants, eleven hundred British soldiers, and more than two thousand French were killed and wounded. Six guns, one eagle, two Generals (both mortally wounded), together with four hundred other prisoners, fell into the hands of the victors. Many officers became celebrated, dating from the battle of Barossa. Gough was then the commanding officer of the 87th, who rose to be Lord Gough, and a mighty soldier in China and India; Wheatley, who died Sir Henry, Privy Purse to his Sovereign; John McDonald, who lived to be Adjutant General of the British army, all cropped honors from the enemy, to weave a garland for themselves. Parliament voted thanks to the troops engaged, and the 87th regiment, which captured the eagle of the French corps, was thenceforth called the Prince of Wales' Royal Irish Fusiliers, the plume and name it bears till this day. In the opinion of Lord Wellington, the bravery of the troops on that day saved the allied army; and from all appearances and report, the officers and men who compose the 87th to-day are worthy successors of those who fought at Barossa, when the fierce, rapid, prolonged charge of the 87th Regiment overthrew the French lines.—*Academy Recorder*.

The band of the 63rd Halifax Volunteer Battalion had their annual sleigh ride yesterday afternoon. They left town at 2 o'clock in two of Robinson's four horse teams, with music and flying flags. They put up at French's hotel, Bedford, where they were well provided for. At dinner, after the customary loyal toasts, the health of Bandmaster Blackman was proposed, followed by the toasts of "The Guests," "The Ladies," "The Committee," &c. Songs were given by Messrs. Shanahan, Gough, Mabey, and Anderson. After spending a pleasant time at Bedford the party returned to the city, arriving home soon after 10 o'clock. They made quite a display of torchlights and rockets.—*Id.*

REMITTANCES Received on Subscriptions to THE VOLUNTEER REVIEW up to Saturday the 13th Inst. :—

Danville, Q.—Dr. Mr. T. P. Cleveland, Jan. 78 \$5.00
Forest, Ont.—Capt. J. C. Pollock, to May '75 2.00
Gonaogoc, Q.—Lt. Geo. H. Mitchell, June '78 4.00
Montreal, Q.—Capt. S. Pope, to January '78 2.00
Kazubaria, Q.—Capt. Chamberlain, Nov. 74 1.00
Wilmet, N. S.—Ed. John Hawkins, Oct. 72 2.00
Winnipeg, M. C.—Major W. Kennedy, Sept. 74 6.00
Victoria, B. C.—Capt. Roscoe, M.P., Jan. 76 5.00
St. Mary's, O.—Capt. A. W. Dodd, May '75 6.00
Sackville, N. B.—Hon. Col. Bolford, Jan. 78 2.00