

substitute vessels of wicker work covered with skins which was undoubtedly copied by Cæsar or some of his officers from the *Corrach* of the ancient Britons—they are remarkable for the boldest military structures in the bridge way on record as the bridge they caused to be built across the Rhine is an evidence, and some of their permanent structures remain till this day. During the middle ages this branch of military science was neglected, armies were small, and military operations local. The thirty years' war in the beginning of the seventeenth century compelled a revival of the art, the armies operating in the field were compelled to cross the Elbe, Vistula, Rhine, and Danube, this was effected by means of vessels constructed of oak, bearing trestles carrying floor timbers.

About the middle of the same century the Dutch improved on the practice by employing batteaux or small light vessels in the formation of military bridges, those were technically denominated pontoons and were generally built with flat bottoms, sides nearly vertical gradually diminishing from amidships to each end, terminating in an inclined place, making an angle of 45 degrees with the water; this admitted of variation, one end being occasionally a vertical plane, the frame work of timber was covered with tin.

This improvement was quickly adopted by the French, and in 1672 they are said to have a complete pontoon train.

Early in the eighteenth century all the great nations in Europe were provided with batteaux of a similar form, some had the frame work covered with copper, others and notably the English with tin; the Russians used pontoons covered with sail cloth.

Towards the close of last century the French adopted a species of pontoon capable of transporting from fifty to sixty men across a river. Its length was 36 feet five inches; breadth, six feet nine inches; depth of hold, three feet nine inches; and weight, 4,079 lbs. Since 1829 they have adopted a flat bottomed vessel whose sides are nearly vertical, the ends are curved like those of a canoe; the length is 31 feet midship; width, five feet seven inches at top, four feet four inches at bottom; depth, two feet 6½ inches; the frame of oak covered with fir planks; weight, 1,657 lbs.; its buoyancy or weight that would sink it to the level of the gun wale is 18,674½ lbs.; when used as a bridge they are placed 19 feet eight inches asunder; the roadway is 11 feet wide.

The principle of this description of pontoon has been adopted with variations of construction by all the European powers.

The conditions governing their construction are as follows:—

That their capacity and solidity be such that a bridge formed of them may be able to support the greatest weight accompanying an army, and that the weight of the batteaux be the lightest.

That they may answer as well for row boats to establish lodgments.

That their forms and dimensions be such as to admit of being easily mounted on carriages for transportation.

The great unexpected and unparalleled success of Prussia during the war of 1870-71 astonished the civilized world, in the excitement consequent thereon the impulse to account for the surprising events that succeeded each other with magical rapidity, entirely overbalanced the calm analytical system of reasoning in accounting for facts connected with the greatest revolution of modern days, and allowed speculators to exercise their fancies in the construction of theories without the slightest basis of fact and with which no normal law was in accordance.

The prevailing theory was and has been that contained in the idea that Prussian organizations, discipline, and strategical training were the main elements of Prussian success, that all those qualities were wanting in their opponents and that finally the abstract quality of Teutonic valor was superior to the Celtic bravery and *elan* tested on many a hard-fought field of historic fame.

Acting on the impulses derived from this idea reorganization of armies has been and is the employment of those states whose tenements are about to be set in order, so that it is in reality a political epidemic raging with greater or less violence according to the interests at stake.

It is particularly virulent in Great Britain pervading all classes from peer to peasant, and is quite successful as far as the disorganization of the military force of the Empire is concerned, and the total demoralization of its departments; to such a degree has this been carried that with the vast outlay of over sixteen millions sterling annually, it would take the English war department six months to partially equip a force of 30,000 men.

Leaving the consideration of this deplorable mistake for the present, a calm investigation of the real cause and secret of Prussian success will be interesting, especially as it tends to dispel the mystery which surrounds the subject and will show on what slight foundations, or rather no foundations at all, massive theoretical structures are raised.

There can be no better authorities for the causes which led to Prussian success than the Prussians themselves, one distinguished officer attributing to "the personal temperate and hardy habits of his sovereign," one of the chief or primary elements of success, a series of lectures delivered by Captain Laymann at the Division War School at Cassel before the late contest, would apparently lay it down as a maxim not to be contradicted, that the secret lies in taking the "offensive in action," on every occasion; as the gallant Captain is or was instructor in tactics it is quite probable that one element

of success may be traced to audacity—how far that quality would comport with the successful operations of a campaign remains to be seen.

Other authorities trace it to the careful training bestowed on the armies, the ease with which the tactical unit is manœuvred, the superior intelligence (sic!) of the staff and regimental officers, their superior knowledge of country, the intelligent use made of cavalry, and the obedience of the soldier, while the great strategical abilities, political and military of Bismark, Von Moltke, Von Roon, Prince Charles, and the Sovereign are advocated by others as the chief causes of success.

While admitting the Prussian system (if that can be called so which is in a constant state of revision) to be admirably adapted to the social, moral, intellectual and political circumstances of the people, there are other elements of success which must in reality be looked for as primary, and those consist of the political capacity of the Prussian people which enables them to bear all the burdens of military despotism with patience, and enables their sovereign to turn out the whole population en masse as soldiers if necessity demands it.

This placed in his hands a power which effectively used cannot fail of success, the facility of concentrating vast masses of troops at any point, so as to completely overpower his opponents by numerical force, and this alone is the great secret of Prussian success.

According to the Prussian "Staats-Anzeiger" they had at Woerth 120,000 German troops against 47,000 Frenchmen; at Gravelotte, 250,000 against 140,000; at the battles around Sedan, 290,000 against 140,000 French. No discipline, no knowledge of strategy, nor no skill could snatch victories from the banners of such hosts. The First Napoleon, a giant in the art of war, was beaten to the earth by similar proportions, and there is no need for assigning any peculiar excellence to the troops achieving such victories, admiration should rather be given to the soldiers, badly disciplined, worse led, and infamously treated with respect to provisions and munitions of war, that stood unflinchingly to be ground to powder by such an over-whelming preponderance of force.

A careful analysis will show that we have nothing to learn from the organization of the Prussian Army, nor would the people of this country desire to copy any civil military or political institution therefrom, if our Parliament can find money to furnish the arsenals required in each military district, and if our Quarter-Master General's department was once organized, all the requirements of an efficient military force would have been provided without compulsion, consequently we never had the slightest desire to copy any part of the Prussian system.

In England with a small but very easily