

chesto—8 inch diameter, blown by steam or air, 45 lbs. pressure, and one 6 inch ditto, sounded by steam, 75 lbs. pressure.

The *air horn* is a brass trumpet 8 feet 6 inches long, 3 inches diameter at mouth-piece 22½ inches at end; the reeds are 10½ inches long, 3 inches wide and one fourth of an inch thick, sounded by air of 18 lbs. pressure.

The *siren* is a straight cast iron trumpet 16 feet in length adapted by Messrs. Brown, of Progress Works, New York, to fog signalling purposes. Its main features are that the sound is produced by puff of steam operating on two disks with radial slots, one rotating at the rate of 2,400 to 2,800 revolutions per minute; the other fixed at the throat of the trumpet, the steam pressure being about 70 lbs. to the square inch.

This latter is undoubtedly the best and most powerful of known instruments for fog signalling purposes and against all disadvantages of atmosphere and wind, can be heard at a distance of two miles at least, while its range would extend to 16½ miles.

Compressed air produced by a large *caloric* engine has been successfully applied to work this valuable instrument, and thus the danger, as well as expense of steam is avoided, and the advantage secured of the ordinary Light House keepers being able to work the machinery.

The experiments with the guns were conducted by Major MITLAND, R.A., Assistant Superintendent Royal Gun Factory, Woolwich—a very able paper entitled “Fog Signalling by Explosives,” was read by that gallant officer before the Institution on 17th May—and the results of the very valuable experiments given were that the 24 lb. (5½ inch) howitzer with a charge of 3 lbs. L. G. powder was the most effective Gun for Fog Signalling in existence.

A very excellent paper on “Fog Signalling for Vessels Under Way,” was read the same evening by Staff Commander JOHN CUMMINS RICHARDS, R.N. Hydrographic department, Admiralty—in which a most ingenious and valuable plan was propounded for trumpets or horns on sailing vessels, and steam whistles on steam vessels being employed in not only by sound giving evidence of proximity, but even of the direction in which the vessel was sailing and the manœuvre, if any, in operation.

This would be effected by one whistle or horn producing a *shrill* and the other a *bass* sound, and a simple combination of those sounds—analagous to the marks produced in telegraphy, known as “Morse’s alphabet,” could be made to communicate quite plainly all necessary information—indeed, the whole *modus operandi* is so simple, that it is difficult to conceive how it could be overlooked—one note on each instrument is all that would be required, and the most ordinary intelligence could supply that.

A very animated discussion followed the reading of the last paper—into which we

cannot enter—further than to say, considerable light was thrown upon the cause of some of our naval mishaps thereby. One conclusion we think necessarily follows from those experiments, and that is a *differentiation*, so to speak, of the signals is a necessary corollary of the experiments—that is the *siren* should be placed on Light Ships and Light Houses far from the Coast—the *Guns* on shore.

Some very interesting facts relative to the transmission of sound were ascertained during those experiments, and Professor TYNDALL has written a work on the subject.

The following, which we copy from the *United States Army and Navy Journal* of 27th November, shews us that “there is nothing new under the sun”:—

“Professor Tyndall has been called to account by the *Nation* for what it charges to be an unfair appropriation of other men’s labors to his own reputation and advantage. In noticing the Professor’s recent work on ‘Sound,’ the *Nation* finds an account therein of various experiments made by the Professor of the English coast under the auspices of the ‘Trinity House,’ or English Light House Board, on the effect of fogs, currents of air, etc., and on the transmission of sound signals at sea. In one chapter of his book Professor Tyndall claims to have been the first man, since Dr. Derham in 1708, who has made such experiments, and totally ignores all that had been done by the Light House Board of the United States on the same subject for years past. He admits only that he had heard ‘in a general way’ of something having been done in the United States, but nothing further. The reviewer then points out that when Professor Tyndall was in America, in the winter of 1872-3, Professor Henry, at a meeting of the Washington Philosophical Society, called in honor of Tyndall himself, read before that gentleman a paper on the phenomena of sound in fog signalling, etc., embodying experiments of the same character as those which Tyndall himself commenced May 19th, 1873, and now claims as the first since 1704. It further appears that Major Elliot, U. S. Engineer, being sent to Europe by our Light House Board was invited to attend Tyndall’s experiments at Dover, and found, on making his report, that, in the language of the Light House Report for 1874, ‘the researches of our Light House Board have been much more extensive on this subject than those of the Trinity House, and that the latter has established no facts of practical importance which had not previously been observed and used by the former.’ The appendix of the report is written by Professor Henry, Chairman of the Board, and records these experiments back to 1855, the same which Henry had summarised in the paper publicly read to Professor Tyndall before the latter turned his attention to sound at sea, and began his experiments with a steam siren, patented in America by an American, introduced into the American Light House system by Professor Henry, and gratuitously lent to Professor Tyndall by the same Light House Board whose previous labors he ignored in his present work. If the facts stated by the reviewer are uncontradicted Professor Tyndall will have to defend himself from the charge either of misappropriation or of very remarkable ignorance on a scientific subject.”

Sir S. J. Gibbons, who was Lord Mayor of London in 1871, is dead.

THE late PRINCE CONSORT is reported to have once said that “Representative Institutions were on their trial.” Well, although there was a howl amongst the Democratic philosophers, events proved that great man was in the right, and as that wise saying was elicited by the failure of the British system of military organization during the Crimean War, if his life had been prolonged he would have ample reason to judge of the working of a similar system in another country governed by similar institutions and inhabited by men of the same race.

We copy from the *New York Sun*, an article on “the Army of the United States,” which gives point and force to all we or any others have urged as to the fallacy of the principles on which what is called the “Regular Army” in Great Britain and the United States have been organized. Our contemporary goes straight to the root of the matter—it shews the system does not provide a career for either officers or men, that it is totally rotten, and that in “Free States” a force not recruited from the mass of the population, but necessarily by its organization from its worst classes is a delusion, a mockery, and a snare. This lesson was pretty well taught by the events of the great war between North and South—when the regular army of the former *did not form* what its admirers predicted a *nucleus* around which the untrained organization of the people would rally, but it was dissolved at the first shock and no more appeared during the struggle.

The United States Army is for “foreign service,” and therefore must follow the rules of all such organizations; if it wants the manhood it must be recruited from the mass of the population.

An English officer of some distinction has been greatly blamed for saying that any *old woman* could attain excellence in the pursuits of civil life, but that it required a *man* to be a soldier. When such a qualification is necessary the army must provide a career worth following, and it will not do to set at the head of the men others who are not soldiers, but mere school boys. Success in competition examinations or literary honors acquired by a Collegiate career are no sure guides in discerning a man’s fitness for military life in most cases except where the *scientific corps* are concerned. They are of a character to produce such officers as our contemporary describes—*savants* totally unfit to lead men, although they may be qualified to teach.

The only solution of the problem affecting both countries is to be found in making the personal popularity of the officer, *i.e.*, his standing in society, the first qualification, and his ability to raise as well as recruit his command the necessary price for exercising it.

We take it as a matter of course, that in a country like the United States, the organization will have to be based on the local militia of which it should be the highly elite