anchor over, so as to bring the stock into its true position, namely, flat on the ground, and of course the flukes upright. This tendency is the obvious consequence of the stock being so much longer across than the flukes are, which naturally causes the anchor to tumble over into its right position, when­ever the stock is not lying flat, as it ought always to do.

For many years after the introduction of chain cables, hempen messengers were used to heave them in; now chains are almost universally used, and a great expense saved. The messenger is the endless rope which passes round the cap­stan, and being attached to the cable by what are well called nippers, draws in the cable along with it as the capstan is hove round. Iron nippers, too, must soon become universal. Chain slings for the lower yards have long been in use, and of late years chain topsail sheets, and chain ties, have been introduced, as well as chain gammoning for the bow­sprit, and chain bobstays, which are great improvements.

Attempts are now making, and we feel convinced that they will ere long succeed, to introduce iron *wire* rigging, which we consider as stronger and better than chain, be­cause less dependent on the accidental quality, and careless manufacture of a single part. And here we cannot help re­marking, how strange it is that the plan of making iron bridges of wire, so successfully adopted in Switzerland, France, and elsewhere abroad, should not yet have found such favour in England as to be fairly tried. The noble bridge of Freyburg in Switzerland, is several hundred feet wider than the Menai bridge, and though it consists of but one span, it is equally strong, if not stronger, and has cost not a fifth part of the money. We do not think wire will answer for running rope ; but for standing rigging it may, we conceive, be most use­fully substituted for hemp.

The use of iron ballast, instead of dirty shingle, is also a recent, but valuable improvement, and though the first cost is greater, it very soon overpays itself. Iron ballast was first officially established in the navy about the year 1796.

The next most important use of iron is in a department of seamanship which is by no means to be lightly treated of, we mean the watering and provisioning of ships. The in­troduction of iron tanks into the navy and merchant service has in many ships doubled, and in all very greatly increased, the quantity of water which can be carried to sea; whilst the quality has been improved in a manner, of the extent and blessing of which no one can form an idea, unless he car­ries in his recollection the filthy stuft’ which it was so often the lot of seamen to drink in bygone days. The following statement shews, in a rough way, the gain of stowage.

The cask called a butt occupies about 35 cubic feet of space in a ship’s hold, and this space, if it were entirely filled with water, would contain 217 gallons. A butt, however, actu­ally holds only 108 gallons, so that one half of the space is lost by the thickness, and by the form of the cask, which is the worst possible for stowage, so far as room is concerned. An iron tank, of the largest kind at present made for ships of war, is called a four-feet cube, though it measures about an inch more in its external dimensions, and occupies 68 cubic feet of space. This area, if entirely filled with water, would contain 424 gallons, but it actually holds 400, which is only 24 gallons less than the space could possibly contain. In other words, by using casks, you lose eight-seventeenths, or nearly a half, of the stowage room, whilst by using tanks you lose only one-seventeenth.

A farther increase in the stowage of water is gained by having iron tanks made either of a wedge, or of a flat form, to suit the curve of the ship’s hold, or to enter spaces too low to receive cubical tanks.

A single example of the change which took place in a line-of-battle ship, will shew the gain effected by employing iron tanks instead of casks. The Melville, of 74 guns, when fitted with casks, stowed, of water, 47,624 gallons, or 2121/2 tons. But when iron tanks were substituted, she stowed

88,232 gallons, or 394 tons, or about four-fifths more water. Thus, if the Melville, with a crew say of 600 men, at *a* gal­lon of water each per day, could keep the sea for only 80 days, or not quite *three* months, if it were kept in casks, she might carry, at full allowance, 147 days water, or very nearly *Jive* months, if it were stowed in iron tanks.

We have recently heard of some ships in which the bread, and other dry provisions, were stowed in iron tanks, with great advantage, not only in respect to stowage, but in preserving the provisions from decay. In hot and damp climates this becomes a primary consideration ; and we know of a ship of war which, during the long and arduous campaign against the Burmese, by keeping her dry provisions in tanks, effec­tually excluded from the air, preserved the whole of her bread, flour, pease, cocoa, and rice, in the most perfect con­dition; whilst in most of the other vessels a large proportion of all the dry provisions were either decayed and rendered useless, or were eaten up by weavels and cockroaches, in spite of every care, greatly to the inconvenience of the public service.

This recalls to our recollection the preserved meats, soups, and vegetables, in cylindrical tin cases, first devised, we be­lieve, by M. Appert, a Frenchman, and now in general use at sea. These meats are expensive, no doubt, but in the long run they often prove not so costly as live stock, because they eat and drink nothing. In all her Majesty’s ships, these preserved meats have long been supplied to the sick ; and we are of opinion it would be sound economy to serve them out once or twice a-week to the ship’s companies ge­nerally.

The next most material change for the better, to which it is our duty to advert, in speaking of seamanship in the most extensive sense of that word, relates to the manner in which all ships are now navigated from port to port, and to and from the most distant parts of the globe, not only with far greater celerity, but with much greater safety than formerly. This truly wonderful improvement which has of late years been introduced into the art of seamanship, in short­ening voyages, and adding to their security, as well as certainty, is due, mainly, first, to the superior knowledge of the persons in charge of ships ; secondly, to the improved quality, lower cost, and greatly increased number of scien­tific instruments and astronomical tables, now in the hands of every seamanlike officer; thirdly, to the numbers, accu­racy, and cheapness of the charts of almost all the navigable regions of the globe ; and, lastly, to the more extensive and correct knowledge of the phenomena of the winds, weather, currents, and tides of the ocean. To these vast helps, which every sailor may now avail himself of, almost mechanically, there may be added others which those only can profit by, who, to long experience, add a taste for science, which not only sharpens the observation, but enables an expert na­vigator to appropriate to the purposes of his voyage, the thousand and one variations to which the elements are sub­ject, but which no books, no rules, nor even talents, can ef­fectually teach the mere seaman how to apply. Nothing, indeed, is more difficult in the practice of this branch of seamanship, than removing from the mind of an old sailor erroneous impressions as to fact, even when substantial means of correction are lying on his table. The truth is, the na­vigable world is so wide, the phenomena of nature so grand and varied, that until we are schooled by actual experience, we have not the means of grasping a sufficient number of observations at once, to enable us to generalise them into a practical shape, in the complicated art of seamanship.

In the first rank of modern instruments used at sea, stands the Sextant, not the old wooden quadrant of our grandfa­thers, and even some of our fathers in the art, but the brass sextant of Troughton, Dollond, or Cary, divided to ten se­conds, and capable of taking lunar distances with precision. With such an instrument in his hands, and with such a nau-