ENGLISH AND AMERICAN FISHING VESSELS.

One of the most valuable features in the late Fisheries Exhibition was the opportunity it afforded to practical fishermen —a class unapt to acquire instruction from books—for comparing their own vessels, gear, and modes of fishing with those of other nations. The British seaman is proverbially self-satisfied, and the characteristic is certainly as well defined amongst the fishing classes as in any other branch of our maritime population. Nevertheless it must have been brought home very forcibly to all but the most case-hardened egotists that, at any rate, there are a few points of foreign fishing practice which we in England might study with advantage. The United States Court was, without doubt, the most complete and best organized amongst all the foreign displays, and it was to that one naturally looked for affording a comparison. With respect to fishing gear there was a vast deal that it would be desirable to see, at least tried, in British waters; amongst so many that are new to us, and so much that has proved entirely successful on the western side of the Atlantic, we could scarcely fail to find many appliances which would be valuable as an addition to our means of capturing fish. With regard to the fishing vessels of the two countries, no doubt there is less that is desirable for us to acquire. Taking only the larger craft engaged in ocean fishery, the North Sea trawler and the New England schooner may be considered as the most important vessels of each nation. Our own country had the advantage in the matter of representation, Messrs. Alward and Eskeritt's splendid model being without doubt the finest exhibit of the class in the whole Exhibition, and very rightly took the special prize. Although the Americans had no single model that for accurate representation of a typical vessel in shape, rig, and equipment equalled this English boat, yet their collective exhibit, illustrating nearly every type of fishing boats in use throughout the United States, stands, we should think, unrivalled as a comprehensive illustration of the fishing vessels of any nation. Of the New England schooner there were about half a dozen models, all giving faithful illustrations of the type of craft they represented in the manner of model and rig. We were not fortunate enough to get the lines from which any of these were taken, but on page 36 will be found those of a fishing schooner designed by Captain J.W. Collins, a member of the United States Fish Commission. Fig. 1 is a fore and aft section, showing the general arrangement. Fig. 2 shown construction and cabin plan. Figs. 3 and 5 are respectively half-breadth plan and body section. Fig. 4 is a section through the ice lockers and well. Fig. 6 is the sail plan. This vessel in general contour may be taken as a typical Yankee schooner, but the beam is 10 in. less and the depth 18 in. more than is usual with the New England craft. In order, therefore, to make a fair comparison the middle body should have a lower bilge, in fact the sections should be somewhat flattened the characteristic hollow floor being however, retained. The rig, too, differs in some respects. The well also is an unusual feature in craft of this description.* On page 36, Figs. 7, 8, and 9 we give the lines of a typical North Sea trawler, taken from drawings kindly furnished to us by Mr. W. E. Redway, late of Dartmouth, who has designed many successful trawlers now working in the North Sea. The vast difference between the English and American vessels will be seen at a glance, the broad characteristic of our home model being safety, whilst the New England lines are calculated to afford high speed.† The American fishing schooners carry an immense spread of canvas in terms of their displacement, and have great natural stability, which enables them almost to dispense with ballast; a mackerel schooner of from 70 tons to 80 tons, carrying about 10 tons of stone only. On the other hand, the round sections of the North Sea trawlers are not calculated to afford the stability requisite for sail-carrying power unless aided by ballast; a modern North Sea trawler having as much as 50 tons to 55 tons of iron stowed as ballast. The English form is, however, one of very great strength, and a good depth of the hull being under water, gives the vessel power and ability to live through heavy weather. It is of course impossible to say how far the two types of vessel fulfil the conditions they are especially designed to meet. The terrible losses incurred by the North Sea fleet during the gale of March 6th last place us at a special disadvantage when comparing our national type. On that occasion 47 vessels and 240 lives were lost, besides casualities of a less series nature.

During the gales of December, 1876, on the American side of the Atlantic, 12 schooners and 95 men were lost on the banks from the Gloucester (Massachusetts) fishing fleet alone. Of course these figures prove nothing. The gale of last March in the North Sea was entirely exceptional. It was not so much the strength of the wind that overwhelmed the fishing boats, as it was the vast tidal wave which arose and carried all before it.

The average annual loss of British fishing vessels for the last five years 1876-77 to 1880-81 was 34 2-5th, and during the year 1881-82, 40 British were lost or missing.

We have no particulars of the losses of fishing vessels throughout the United States, but those hailing from the port of Gloucester—by far the most important fishing station in America—are recorded in the Fisherman's Own Book, a publication to which we have on former occasions referred.

In 1876, 27 vessels and 212 men were lost. 1877 (a year of depression in the fishing trade), 7 vessels and 38 men. 1878, 11 vessels and 55 men. 1879, 29 vessels and 249 men. 1880, 4 vessels and 52 men.

In comparing the American schooner and English ketch-rigged trawler it will be of course remembered that the mode of fishing followed by each type of craft is essentially different. A vessels with quarters like the New England schooners could not be used for towing a large beam trawl during average winter weather in the North Sea. Still our cod smacks, which are used for much the same purpose as the American craft, are built nearly on the same line as the trawlers, and the two types of Yankee schooner and North Sea ketch may be taken as nationally characteristic, independently of the style of fishing pursued.

Since we gave some particulars in our number of October 5th last year of the mode of fishing pursued by the New England vessels by means of the small boats called dories we have had many inquiries for further particulars of these little vessels. On page 36, Figs 10 and 11, we give illustrations taken from a model shown in the Fisheries Exhibition. This a shore dory, and is fitted with a sail and centre board. There are also small pieces of decking, or water-ways, at the sides. The dories carries in nests on board the schooners have neither decking, centre board, or rudder, and thwarts are made to take out. We have already given particulars of these small but important craft, and of the dory winch used with them, which we also illustrate in Fig. 12.—*Engineering.*

* There are, however, a few well vessels used in America. They are mostly sloop-rigged, and catch cod, halibut, blue fish, black bass, sheep's head, etc.

† In Mr. Dixon Kemp's "Yacht and Boat Sailing" comparison is made between the English and American types of schooner, to which those interested in the subject would do well to refer.

STRUCTURAL STEEL.

BY E. B. DORSEY, M. AM. SOC. C.E.*

The paper gave the results of an examination by the writer into the subject during two recent trips to Europe. The steel used for structural purposes is called generally in England mild steel, and in Germany, homogeneous iron. Experts in Great Britain generally rely more upon physical tests and the reputation of the manufacturer than upon chemical composition. The physical requirements are stated, and the manufacturer uses his discretion as to the composition which will answer these requirements.

The rules for testing steel adopted by the British Admiralty, by Lloyd's Register, and by the British Board of Trade, were given. The tendency among English engineers is to use steel still softer than has heretofore been thought best. Some large builders use nothing in their boilers over 26 long tons tensile strength per square inch and 25 per cent elongation in 8 inches, Others advise the use of steel of from 23 to 25 long tons tensile strength with the same elongation.

American engineers require from 15 to 20 per cent higher tensile strength than the English. The Siemens-Martin, or open hearth steel is preferred by nearly all experts for structural purposes, the Bessemer steel being principally used for rails. Ship-builders are decided in their preference for the open hearth steel. A much larger number of plates would be condemned of the best wrought iron than of steel. Data were given as to loss of strength in steel plates by punching. Steel can be manufactured into much heavier, larger and wider pieces than wrought iron. Steel rivets are used on the Clyde exclusively in rivetting steel. The new Forth bridge is to be built of mild steel. The use of mild steel is extending very

* A Paper read before the American Society of Civil Engineers.