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NAVAL PROGRESS IN 1869.

IN pursuance of the promise we made last week in our annual summary of the past year we now proceed to place before our readers the most prominent features relating to naval architecture during that period. The year 1869 opened upon a time of bustle and excitement, and has been remarkable as regards shipbuilding affairs. The Conservative Government had just gone out of office, and the present Ministers were loudly proclaiming their intention of effecting great reduction in expenditure without impairing the efficiency of the navy. At that time a great number of ships were being built for the service, many of which have now either been completed or will be very shortly. Of the six second-class broadside ships of the "Audacious" class ordered by the late Board of Admiralty, two, the "Audacious" and the "Invincible," have been launched from Messrs. Napiers' yard at Glasgow, and are within a month or two of completion. The "Iron Duke," building at Pembroke, will soon be afloat, and the "Vanguard," built by Messrs. Laird, Birkenhead, has just been undocked; the other two, the "Swiftsure" and the "Triumph," being built by Messrs. Palmer and Co., of Jarrow, will be launched about the middle or latter end of the present year.

The "Hercules" had, towards the end of 1868, proved herself capable of exceeding her estimated speed, and had been placed in commission. She has now passed through a year of unusually active service and has shown herself to combine great steadiness, hardiness, and general sea-going qualities of a very high order, with her enormous powers of offence and defence. The "Sultan," her sister ship, but carrying slightly heavier armament, is progressing rapidly at Chatham, and will be out of dock in the coming spring. The "Monarch," which was being fitted at Chatham at the beginning of the past year, was pushed on as rapidly as possible and was commissioned last May in time to proceed to sea with the Channel fleet. She is the first cruising turret ship that has been tried, and was accordingly watched with great interest. It will be well remembered how highly she was praised. Perhaps if ever a ship designed and built by the Admiralty has received from the public a full measure of approbation, it is the "Monarch." Her behaviour at sea, and remarkable steadiness in some of the heaviest weather we remember, has certainly never been excelled. Some disappointment was felt by the public when the "Monarch" was gaining such laurels that the "Captain" could not be got ready to take her place in the fleet, because a trial between these two ships had been looked forward to as likely to settle some points regarding cruising turret ships on which authorities were divided. The "Captain," it is hoped, will be ready for sea in a month or two, and we may look forward to her trial, as well as that of the "Audacious" class, in the early part of the year.

Another important addition to the fleet during the past year has been the unarmoured frigate "Inconstant." When out with the fleet she proved herself a splendid sea boat, and throughout the cruise of the squadrons, last summer, was no less remarkable for the superiority of her speed and weatherly qualities under canvas than for her steaming powers. The "Active" and the "Volage" have also been completed during the year. They, like the

"Inconstant," are swift unarmoured cruisers, carrying a heavy armament, but are of a smaller class than the latter vessel. In a recent trial of the "Volage," during a six hours' run at sea, she averaged the high speed of 15.3 knots per hour—an enormous speed for so small a ship. To the ships which have nearly arrived at the state of completion required for launching we may add the "Hotspur," at Messrs. Napiers' yard, and the "Glatton," at Chatham Dockyard. The former is the first pure ram which was laid down by our Government, and the latter is the first of our coast-defence monitors. We should also mention the three monitors building for the defence of the colonies. The "Cerberus," which is for the defence of Melbourne, and is paid for in part by the Colonial Government, will be ready to start for her destination in the spring. The other two—the "Abyssinia" and the "Magdala"—are not yet quite ready for launching. They are for the defence of Bombay, and part of their cost is borne by the Bombay Government.

Whilst the foregoing will show that the past year has been a busy one as regards the completion of ships previously in hand, it will be remembered in the future better by the ships commenced during the year. The introduction into the navy of ships of the "Thunderer" and "Devastation" type will rank as one of the greatest strides that has been made since the first adoption of ironclads, and their completion will place our navy in an exceptionally strong position relatively to those of other nations. These ships have armour little less than twice as thick—which approaches four times as strong—as that carried by the strongest French war ships. They have the low freeboard of monitors, combined with a height of guns much greater than that of an average broadside ship, and have a clear sweep for their turret guns all round the horizon. Masts and sails have been dispensed with in them, but to compensate for this they have an enormous coal supply, sufficient to carry them across the Atlantic. The absence of rig in these ships called up at first some slight opposition, but further consideration seems to have shown the wisdom of the step. The only other important ship laid down by the present Board of Admiralty is the "Rupert." She is a somewhat stronger ram than the "Hotspur," and, like her, is intended to accompany a squadron. This type of ram will play an important part in future naval engagements.

Considerable interest was taken during the summer in the cruise of the Channel squadron. The First Lord of the Admiralty, Mr. Childers, had determined to be present with the fleet during the trials and evolutions which they went through. They joined the Mediterranean squadron at Gibraltar, and the combined fleets cruised for some time together and went through various naval tactics. A flying squadron went to sea during the year, and visited the naval stations, and later in the year the coast-guard ships were called up, and their complements made up from men from the Naval Reserve. The First Lord and Sir Sydney Dacres accompanied this reserve squadron also to sea, and were highly satisfied with the discipline and efficiency of these hitherto almost untried men.

While great activity has reigned throughout the navy, great changes have taken place in the Admiralty itself and in the dockyards. Woolwich Dockyard has been closed and most of the men distributed over the other dockyards. The constitution even of the Admiralty has been altered, and through all the branches there has been a tendency to bring responsibility to bear more directly on each officer.

In the mercantile world, trade looks a little brighter than it did at this time last year, and shipbuilding firms in the north are busy. Those on the Thames unfortunately show

little signs of improvement. The Peninsular and Oriental, and the Royal Mail Steamship Companies, have lately ordered two large mail steamers each to be built—all at very low prices indeed. The Peninsular and Oriental Company's ships are to be built by Messrs. Caird and Co., while those of the Royal Mail Company are to be built by Messrs. Elder and Co., both of the Clyde. The opening of the Suez Canal has given a stimulus to trade. Its influence on shipbuilding seems likely to tend towards increasing the proportion of length to breadth. It is likely also to cause a demand for sailing ships carrying auxiliary engines and a coal supply just sufficient to take them through the difficult navigation of the Red Sea. At the present time, practically speaking, vessels drawing 16ft. or 17ft. of water pass through the Suez Canal freely. The large merchant steamer "Brazilian," belonging to the Merchant Trading Company, of 2,860 tons gross, loaded with 4,000 tons of coals, passed through (after lightening part of her cargo) with about 2,500 tons on board. She is 420ft. long, 37-6ft. broad, and 25ft. deep, with spar deck; thus showing that steamers of great length and height out of water go freely through. But, as our readers are aware, there is an obstructive mass of rock at Serepeum, and which is being rapidly cleared away. When this shall have been effected there will be no hindrance to the passage of vessels drawing from 20ft. to 22ft., or even more. This is vouched for in the report of the Hydrographic Office of the Admiralty, and is therefore beyond all doubt.

Public attention appears to be setting towards the navigation across the English Channel. We hope some good results may arise from the efforts made in that direction by Mr. Fowler and others, and of the committee who are going to inquire into this subject. New harbours and large fast steamers must be built. Referring to our old friend the "Great Eastern," we may note in passing that she has successfully laid the French Atlantic Cable, and is now employed in laying one to India. Upon the whole, the year 1869 has been a very remarkable one in the history of the Admiralty and of the navy. If it has not been as full of events in the commercial navy, it has not been behind any of the last twelve years which have preceded it.

HYDRAULIC ENGINEERING.

OUR winter weather—for, as the French truly remark, climate we have none—has already conferred upon the country its annual contribution of destructive floods, occasioning an enormous amount of damage to property, and, in some instances, a loss of human life. As year after year these periodical visitations return with unerring regularity, it cannot fail to strike one that there must be something very defective and imperfect in our national hydraulic engineering. The control, maintenance, and repair of the riverways of the country are of equal importance with those of the roads. In fact, to judge from the consequences resulting from a neglect of these duties, our rivers require the fulfilment of them far more urgently than our roads or even railways. All the great roads constituting the main arteries of inland communication were thoroughly well and skilfully constructed by engineers such as Telford, Smeaton, M'Adam, and others, and, with some exceptions, the majority of the county, parish, and district roads in England will bear comparison with those of any other country. From first to last, the mail coach roads were regarded in their proper light as great thoroughfares of traffic, and no pains nor expense were spared to render them safe and durable. Since the introduction of railways there may be some excuse for the neglect with which water communication has been treated, but had our rivers been pro-