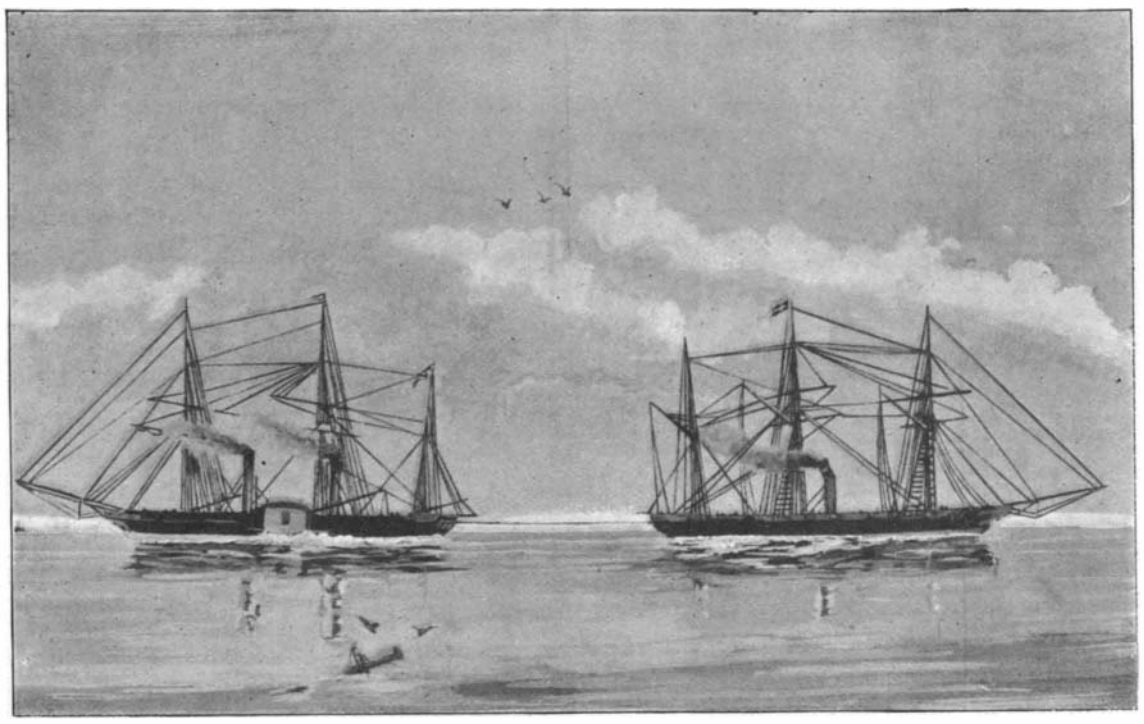
A "TUG OF WAR" BETWEEN EARLY STEAMSHIPS.

Our English contemporary The Engineer has been publishing an interesting series of articles entitled "Shipbuilding and Marine Engineering on the Thames in the Victorian Era." We reproduce one engraving from this important series of articles. It represents the "tug of war" trial which took place on June 20, 1849, and lasted one hour, the two vessels being tied stern to stern and the engines of both set going, with the result that the screw-propelled Niger dragged the Basilisk backward against the whole force of her engines at the rate, by log, of 1·466 knots an hour. These vessels were at the same time tried at different depths of immersion, and the conclusions arrived at from the results obtained were that, in similar vessels exerting the same amount of engine power and impelled by steam alone at their highest obtainable speed, the screw is the most advantageous propeller at deep immersions and the paddle wheel the best in the case of light and medium immersions.



"TUG OF WAR" BETWEEN BASILISK AND NIGER, 1849.

Both the vessels were fitted with four hundred nominal horse power engines. The propelling engines of the Basilisk were of the ordinary oscillating type and those of the Niger were a special kind of direct acting horizontal engine, having two pairs of cylinders; one pair being placed on each side of the main crank shaft, with an air pump between. Each piston had two piston rods working in different planes, one being above and one below the crank shaft, the rods of each pair of cylinders being connected to one crosshead, from which a connecting rod passed to the crank and put its shaft in motion. The air pumps were worked by a similar arrangement to that by which the motion of the pistons was communicated to the cranks, the whole forming one of the best examples of direct-action engines that had at their time been produced.

TRIAL TRIP OF A BRITISH BUILT TORPEDO BOAT DESTROYER FOR THE SPANISH GOVERNMENT.

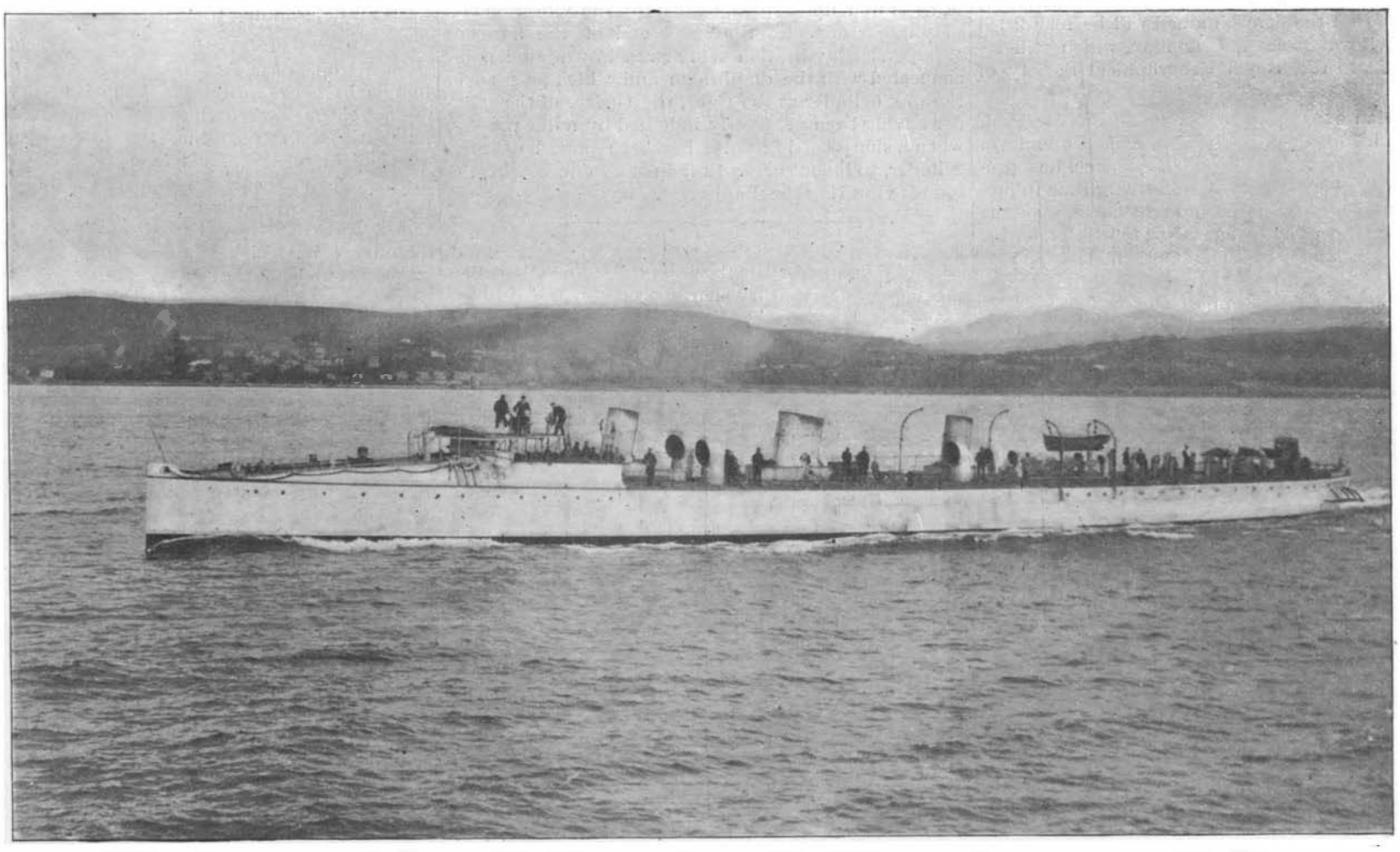
BY OUR ENGLISH CORRESPONDENT.

The official speed trials of the torpedo boat destroyer Pluton, of 400 tons and with engines of 7,500 indicated horse power, which was constructed by the Clydebank Engineering and Shipbuilding Company (Limited), near Glasgow, to the order of the Spanish government, were successfully carried out on the Clyde on Thursday, November 4. On behalf of the Spanish government the tests were watched by a government commission under the presidency of Commodore Triguiro, with whom were Lieutenants Ariba, Guimira, Vazguay, Naval Architect Taliso, Messrs. Thomson, Gordon and Haynes. The Pluton, which is one of a number of destroyers building at Clydebank for the Spanish government, is 225 feet long, and is thus somewhat larger than the latest class of British torpedo boat destroyers. She is therefore enabled to carry a considerably greater dead weight, the actual load on board during the trials being 73 tons. The results of the trial gave a mean speed of 30·12 knots on the measured mile, and during a continuous run of one and a half hours a speed of 30·02 knots was maintained. At the conclusion of the forced draught trial, the vessel was, according to contract, run for a further period of two hours under natural draught, the speed attained being 22·7 knots, or $\frac{7}{10}$ of a knot over the contract. During the tests there was a noticeable absence of vibration and the engines worked to the entire satisfaction of the Spanish commission.

The Measurement of Memory.

Prof. Alfred Binet, the celebrated French psychologist, in a paper in the Année Biologique on "The Experimental Study of Memory," treats of this among other related subjects. We quote the following from an abridgment printed in the American Naturalist:

"Although the methods used for measuring the memory may have been crude, as they still are, it is nevertheless a great advance to be able to introduce the concept of measurement into this problem at all. So far attempts have been made to measure but one kind of memory—the direct faculty of acquisition. The experiments deal with the number of memory images that can be stored up at a single trial, without allowing the subject time to rest. This is called in English the 'mental span' of the memory. I have proposed for it the term '*faculté de prehension*' Several successive investigations have already been made on the measurement of the memory for figures and syllables. These are localized memories, the development of which cannot be considered as a sign of the development of the other memories. We must, therefore, make many reservations in interpreting the conclusions to be drawn from these experiments. The experiment may be made as follows: A series of figures is read to the subject at a regular speed (the speed used is in general two figures per second) and without any special accentuation. As soon as he has heard the series, the subject, having been told beforehand of the requirement, endeavors to repeat the figures without error and in the order in which he heard them. The experiment is repeated several times, beginning with a small number of figures, e. g., four which any adult can give correctly: it is then increased to five figures, then to six, and so on, until a number is reached which the subject can no longer repeat correctly. Care is taken to repeat each trial, and to allow sufficient intervals of rest to avoid fatigue and the confusion of figures in the memory. This procedure, adopted by Jacobs, Galton, and many others, has already borne fruit. It is not, properly speaking, a test of the memory alone; it is extremely difficult, be it said in passing, to experiment on any isolated psychological phenomenon. The experiments taken together show, on the contrary, that the subject employs not only his memory, but also his powers of voluntary attention. This explains why children retain fewer figures by this method than adults. Their inferiority is certainly due to the fact that they have less control over their attention. The average educated adult retains seven figures; a child from six to eight retains five; a child of ten retains six. A difference of one single figure is of considerable importance in the results, and it is one of the drawbacks of this method that we cannot operate with fractions of figures. I have had occasion to measure the retentive memory of Jacques Inaudi, the celebrated lightning calculator. He is able to commit more than forty figures at one trial. It will be seen from this how far his memory is above the average."



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