

SHIPBUILDING

A report of a Lecture by

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Mr. Basu thanked the members of the Scientia for the honour they had done him in asking him to lecture before them. He regretted that, as he had been called upon at very short notice, he had not had time to collect his thoughts and the "lecture" would therefore have to be in the nature of a rambling talk.

The reason why he had chosen this subject was because it had something to do with steel which was of interest to all at Jamshedpur and was at the same time the profession in which he was engaged. It was also at the moment of great topical interest politically and commercially.

The shortage of shipping space during the world war had shown how necessary shipbuilding was to the country. During that time many minesweepers and patrol boats were built here.

Shipbuilding was not new to India. For during the days when ships were built of wood India had earned fame as a shipbuilding country and many ships of the British Navy, including some used in the Great Battle of Trafalgar, were built in India. Indian built ships of teak were found to be more durable than British built ships of oak. But with the advent of iron and then steel as a material suitable for the construction of ships the centre of shipbuilding shifted from India as it did even from London in England to the Clyde districts of Scotland where iron and steel were more readily available. Due to the retarding effect of a foreign administration in India iron and steel industry was not developed for some time and the Shipbuilding Industry declined. But since the great enterprise of Sir Jamshedji Tata, there were great hopes of revival.

Lecture at a Meeting of the —"SCIENTIA" at The Tata Technical Institute, Jamshedpur on the 26th March, 1948. Mr. N. R. Venkadia, Asst. General Superintendent, Tata Iron & Steel Co. was in the chair.

Mr. Basu then briefly described the process of shipbuilding from the call for quotations or invitation to tender to delivery of the vessel stage by stage, illustrating with diagrams in chalk on the black board of the lecture hall, the determination of dimensions, preparation of estimates, submission of tender, placing of order, preparation of drawings, laying off on the Mould Loft, preparation of model, work on the scribe board, bending of frames, laying of keel blocks, erection of hull, setting the launching ways, fitting out in the basin, and the trial.

He referred to the painting of the hull which was not for looks but for protection against corrosion and fouling by marine growths. Unpainted mild steel was liable to corrosion. The composition of Indian steel had often been blamed for greater pitting and grooving than British steel, but no proper experiments had been carried out to substantiate that charge and it could be said that if Indian steel were properly painted after thorough removal of mill scale it would prove as durable as any British or other foreign steel.

India required two million tons of shipping. If this was made up by vessels of 8000 tons each, there would be 250 vessels each using at least 2000 tons of steel for construction. That was a great prospect before Tata's. In answer to a question from the audience whether Indian steel had been used on the "JALASHA", recently launched at Vizagapatam, he answered that was so and believed that it would prove a success.

In answer to another question whether wine was the correct liquid to use at the launching ceremony, he said that it was formerly the custom in Great Britain, the greatest shipbuilding country in the world, to christen ships with a bottle full of champagne. The Bottle of Champagne was still used but owing to the influence of temperance campaign the liquid inside the bottle was often tea instead of champagne. The Scindia Steam Navigation Co, however, had established the custom of using a cocoa-nut for their launching ceremonies in Britain and had followed the same custom at Vizagapatam in launching the Jalausha so that there was no hard and fast rule regarding what should be used.

Mr. P.C. Bose enquired what proportion of the space in a vessel was allotted to boiler and machinery. Mr. Basu said in reply that there was no fixed proportion for all or any ship. It depended on

the speed and the conditions of service. The attempt was always to use as small a space as possible. In certain cases as in a tug, practically the whole space was taken up by machinery.

The space taken by machinery depended on the design offered by machinery builders to supply the power required by the vessel. That power depended on the speed, form, length of the vessel and the position of the propeller in relation to the wave formed by the vessel's motion which again depended on the speed. The problem was in the nature of a vicious circle ; the greater the power required, the greater would be the weight of machinery, and the greater the size of vessel to take the heavier machinery and the greater the size of vessel, the greater again the power required and vice versa ; when the hull was so formed that the power required was less the weight of machinery would be less and so the size of hull to take that machinery.

The power required could not yet be determined by any pure mathematical process and resort had to be made to previous records of trials of similar types of model experiments. It was the custom now in all maritime countries to conduct model experiments in specially built tanks for recording the resistance and power required by models of various shapes. Models were towed by a carriage with wheels resting on rails on either side of the tank and run by electricity, the recording instruments being housed in the towing carriage. India had no such tank.

In order to determine from a model experiment the power required by a vessel at any speed the model had to be run not at that speed but at a speed that would create a wave profile exactly "corresponding" with that created by the full sized vessel since the length (and height) of a wave depended not on the size of the vessel but on the speed, varying as the square of the speed. The speed of the vessel and model had therefore to be in proportion to the square root of their lengths. That was to determine the power required to overcome wave making resistance only. The resistance due to skin friction followed a different rule and was more easily and directly determined from the standard experiments on planks by William Froude. An accuracy of 3% could be obtained by the method of model experiments.

The chairman Mr. N. R. Venkadia summed up the lecture in a neat little speech of appreciation which also disclosed that experiments carried out by Tata Iron & Steel Co. in both fresh and salt water on similar barges built of British and Tata's steel so convincingly proved the ability of Indian steel to resist corrosion as much as British steel that the builders of the recently launched "JALAUSHA" at Scindia Steam Navigation Co's Shipbuilding yard at Vizagapatam finally accepted Tata's steel for its construction, steel which they had formerly believed would be rapidly corroded.

ASSOCIATION NOTES

(i) On the suggestion of a member of the Council the question of reduced rates of subscriptions for members retired from services was discussed.

It was decided that in the absence of any specific application from any member for such concession, the question be dropped for the present.

(ii) The firm of Messrs. H. Sen Gupta Advertising Agents was appointed Sole Agents for securing advertisements for the Association Journal for one year on a commission basis.

(iii) The draft application for State Charter for the Association together with a draft of terms for the Charter was approved.

(iv) The Council condoleed the death of Mr. M. Chatterjee, Associate Member of the Association and the Hony. Secretary was authorised to write a letter of condolence to the deceased's son Mr. N. L. Chatterjee. (C. M. dated 12-3-1948)

(i) Letter No. 309/232 Gnl. dated. 31-3-48 from the Secretary, Calcutta Port Commissioners according permission to Mr. S. Basu to serve as Editor of the Association Journal was read and recorded.

(ii) Letter from Mr. N N, Sen, Member of the Governing Body of the Calcutta Engineering College, Ballygunge regarding grievances of the students of the college against their Principal was considered.

It was decided to forward the letter with enclosure to the Chairman of the Governing Body of the college with a request to investigate into the matter and report to the Council.