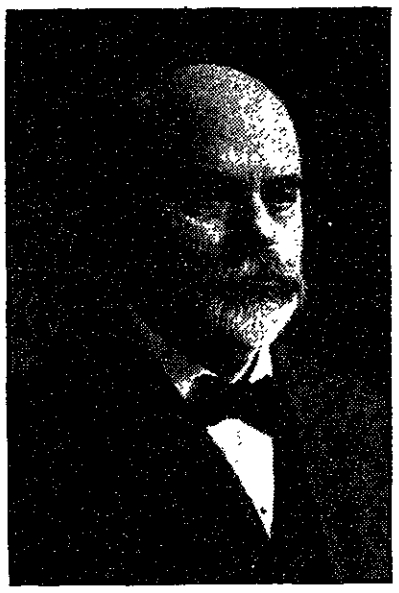
HISTORY OF THE DEPARTMENT OF NAVAL ARCHITECTURE AND MARINE ENGINEERING

By C. H. PEABODY.

A course in Naval Architecture leading to the degree of bachelor of science was offered at the Masachusetts Institute of Technology in 1893, and the first class were graduated in 1895, special arangements being made for transfer of students desiring to take that course. This was the first class graduated from such a course in America. Preliminary work had been in progress several years and instruction in naval architecture had been offered as an option in Course II. The work of the department has therefore been pioneer work as was the case of courses earlier established. The advanced condition at the Institute of methods and means of instruction in mathematics, general science, applied mechanism and steam engineering greatly facilitate the development of



PROF. CECIL H. PEABODY.

this new course; and in particular it was advantageous that the co-ordinate branch of marine engineering was established as an option in Course II as early as 1885. From the beginning Course XIII has been a course in naval architecture and marine engineering and the development of the art and science of modern shipbuilding emphasizes this industry, which is now recognized in the title of the Department.

In 1899 the Department was assigned what appeared to be commodious quarters in Engineering Building B, but immediately outgrew them and in 1904 it was transferred to the present location in Engineering Building C.

In 1901 at the request of the Navy Department the Institute established a graduate course in Naval Architecture, elading to the degree of Master of Science for officers designated for the corps of Naval Constructors and the first class was graduated in 1904. At the establishment of the course Commander Wm. Hovgaard, Royal Danish Navy was apponted profesisor of naval design.

Mr. Walter S. Leland, XIII '96, was appointed assistant professor of naval architecture in 1905. In addition to the members of the teaching staff who are on the faculty, there are now two instructors and two assistants.

MARINE ENGINEERING

By H. A. EVERETT.

All that pertains to the propulsion of vesels through the water has been commonly accepted as the sphere of Marine Engineering, so called, and while this broad expanse is the field of the course the ground actually covered in the routine work is limited, by the shortness of the time available, to the most prominent features of ship resistance, propulsion, and propelling machinery.

Ship resistance, the elements composing it, present methods of- estimating these, and the early experiments of the Froudes which form the foundation for the theory, are taken up in detail. The various methods of propulsion as by paddle wheels, propellers, sails, and hydraulic propulsion are treated and the determination of power for given speeds by the Admiralty Coefficient, Law of Comparison, and Independent Estimate methods. A problem is assigned to be figured in these three ways and this forms the basis for all later work, as the same problem is carried to completion in all of its principal branches such as the design of a suitable propeller, engine, condenser, and auxiliary machinery, and a progressive speed trial for the finished ship.

After the work on power and propeller design, the design of a marine engine, in consonance with the students' problem, is undertaken and, as but the boiler pressure, R. P. M. and power are the fixed quantities (though the type and general proportions are indicated), the work closely approaches the design of an engine "from whole cloth." It carries through to completion a preliminary determination of the various parts of the engine, basing the calculations upon the strength, or practical considerations, such as allowable bearing pressure, according to which has the predominating influence. The theoretical pressure equations, for giving the probable indicator diagrams, are solved, and from these the forces probably existing in the engine are computed and are corrected for the effect of reciprocating parts. The resultant forces are then used to determine the final dimensions of the engine.

Simultaneously with the determination of the principal dimensions and sizes of parts of the engine the work in the drawing room covers the drawing of the parts and the determination of the weights and stresses. The principal dimensions for a condenser to accompany the engine and the proper auxiliary machinery are next determined and the general arrangement of the main engine, with its condenser, and auxiliary machinery is laid out. Visits to ships and ship yards are undertaken as frequently as possible, and in the future it is proposed to have some laboratory work upon the 40 foot launch belonging to the department.

Steam turbines as applied to ship propulsion are also taken up, and designs and drawings are worked out for the De Laval, Curtis and Parsons types.

SUMMER WORK

By H. S. WONSON.

The situation of the Institute gives, to the second and third year students in Course XIII, an opportunity to engage, during the summer months, in the practical work of their profession. The Fore River Ship Yard is close at hand, and the Bath Iron Works, New York Ship, Maryland Steel and Cramp's Yards are within a reasonable distance for summer work. At almost any one of these yards temporary employment as a ship fitter's helper can be readily obtained, and the benefits to be derived from such use of the vacation period are great.

From a purely professional point of view the work is of great value. Not only does the worker acquire an intimate knowledge of the actual processes of ship construction, a knowledge which can be obtained in no other way, but he is serving an apprenticeship that will be a material aid to him in obtaining a better situation after his graduation from the Institute.

His subsequent professional work at the Institute will be greatly aided by such summer work. When the studei has actually worked on the construction of something assigned in the text book, or in the drawing room, the problem is much more interesting, more readily dealt with, and productive of greater results than if he meets it wi no previous knowledge of the methods of solution.

Aside from these points, the meeting and working with an entirely different type and class of men, getting an understanding their ways of living and working, gives one a very valuable asset, available for use in whatever line of work may be later taken up, and an asset absolutely essential to one employing or dealing with labor.

And, last but not least, a summer of hard manual labor in the open air cannot help but benefit a man physically. To one contemplating work of this sort it would be well to say that he must not expect a summer of unmitigated pleasure. Nine or ten hours a day, rain or shine, cold or hot, in a steel ship yard, bear little resemblance to picnicing, and there will be many days when one wishes ships had never been invented. If you live on your pay, which will be about eight dollars a week, you will not have much left, after paying your expenses, to spend on good times in the evenings, but you can console yourself with the fact that you won't care much whether you have or not, for the first few weeks at any rate. But after all, the game is worth the price, and, while you may not think much of the life at the time, you will never regret having had the experience, and when your summer is over, you will come back to the Institute with a clearer brain, a stronger body, and a keen appreciation of the advantages of student life over the life of a worker in a ship yard.