

THE NAVAL ACADEMY AS IT IS.

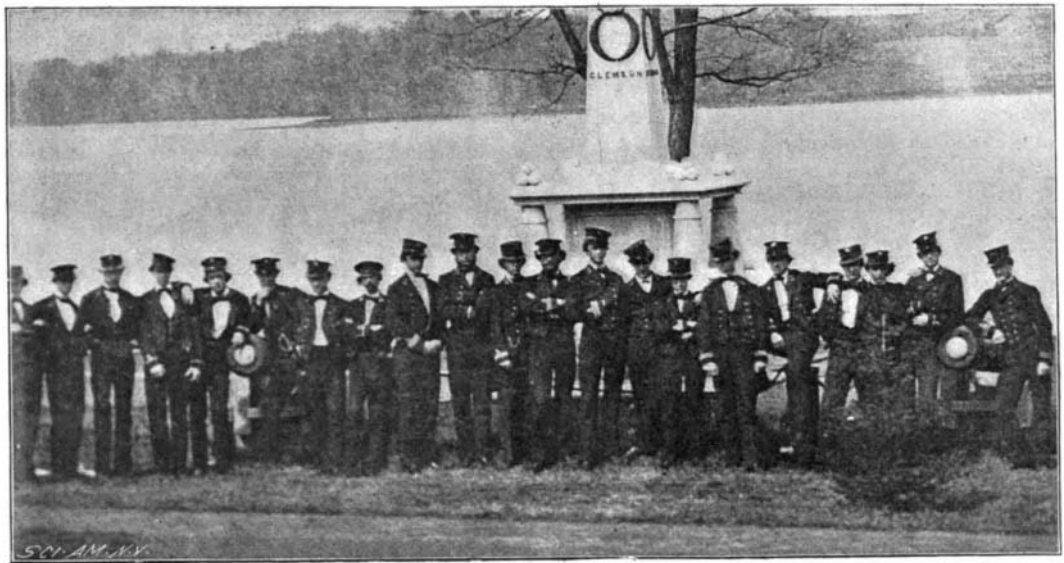
BY PROF. H. MARION, UNITED STATES NAVAL ACADEMY.

The magnificent record made by the American navy in the recent war with Spain has awakened an intense interest among the people of the United States in naval matters in general, and particularly in the Naval Academy, where the officers were educated who won the brilliant victories of Manila and Santiago and who revealed to the world the coming of a new "sea power" of the first magnitude.

The Naval Academy was founded in 1845 by the historian George Bancroft, Secretary of the Navy during the administration of President Polk. A naval commission selected Annapolis as the site of the proposed school. There it has remained except during the civil war, when it was temporarily removed to Newport, R. I., the grounds and buildings at Annapolis being used throughout the war as an army hospital.

Previous to the establishment of the Naval Academy the midshipmen were taught at various naval stations and on board ship. Various efforts were made from time to time to secure the establishment of a school which should be to the navy what West Point was and had long been to the army; but it was not until 1845 that these efforts were crowned with success and a naval school finally established at Annapolis under the direction of Commander Franklin Buchanan, its first superintendent.

The wisdom of locating the school at Annapolis has been amply demonstrated by subsequent events. No-



CLASS OF 1861 IN FRONT OF MIDSHIPMEN'S MONUMENT—ADMIRAL SAMPSON IN CENTER OF MONUMENT.

The new Academic building, which forms part of the general plan of reconstruction of the Academy, will be of magnificent proportions, being 440 feet long and 370 feet deep. Its main entrance will be preceded by a courtyard about 200 feet square.

The Seamanship Department building adjoins the site

ing. A large model ship, full rigged with sails and spars, extends upward from the first to the second story. This vessel has every rope of the most perfect ship upon its masts and spars, and here such cadets as desire to avail themselves of the privilege find every facility for "learning the ropes."

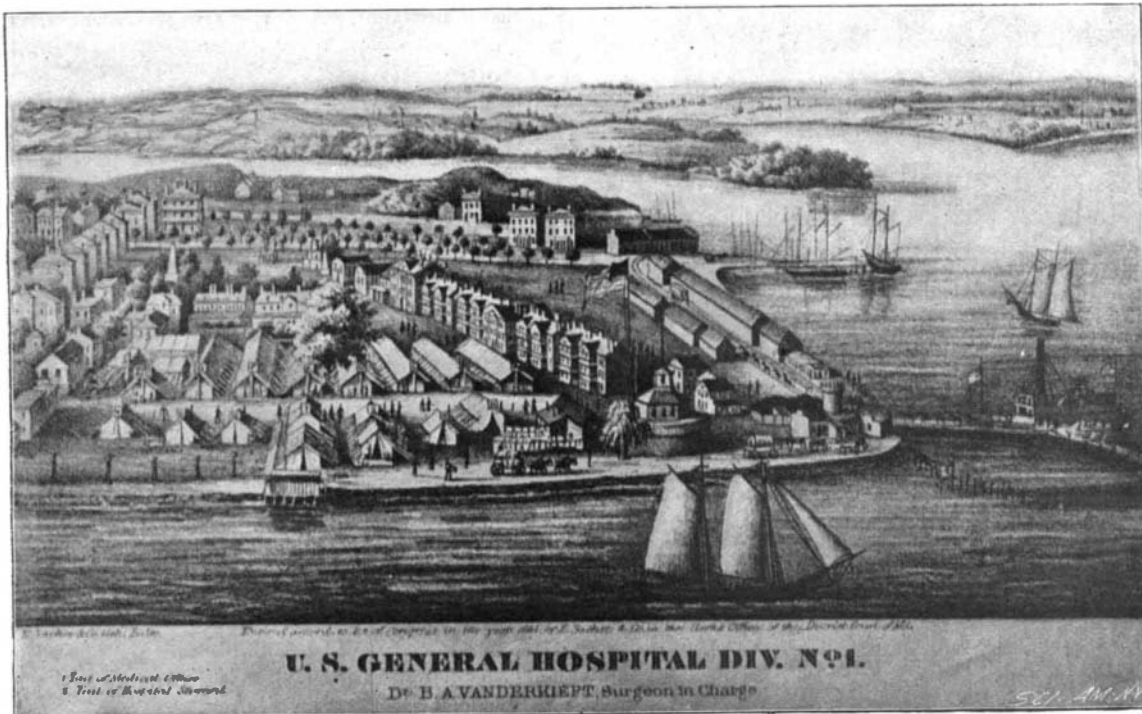
The practical instruction given at the Academy in the various professional branches is very complete, including outdoor drills in seamanship, boats under oars and sail, steam tactics in steam cutters, signals, target practice with revolvers, rifles, machine guns, and great guns, with competition for medals, infantry drills by company and battalion, skirmishers, setting up and bayonet exercises, battery and battalion of artillery, instruction for landing parties, and torpedo firing, practical navigation, deviation of compass, and surveying. The indoor exercises during the winter months include practical ordnance and electricity, steam, gymnastics, boxing, dancing, fencing and sword exercise, instruction in the rigging loft, the machine shop, the boiler shop, the pattern shop, and the model room.

The course of studies covers a period of four years.

During the summer the studies are suspended and the cadets go to sea on a practice cruise lasting about three months, from the beginning of June to the latter part of August. During the month of September they are granted leave of absence to visit their homes and to enjoy a much needed and well deserved rest.

After completing the four years' course at the Naval Academy, the cadets are sent to sea for two years in cruising ships, after which they return to the Academy for a final examination. If successful, after a course in which the principle of "the survival of the fittest" is strictly and impartially carried out, they receive their commissions as Assistant Naval Constructors, Ensigns, Assistant Engineers, or Lieutenants in the Marine Corps, according to the number of vacancies in each branch of the service.

The Lyceum or Naval Institute building, standing next to the Seamanship building, is, perhaps, the most interesting of all the crumbling edifices of the Academy. It was once the chapel of the school and has been successively used as a gunnery room, a museum, a lecture



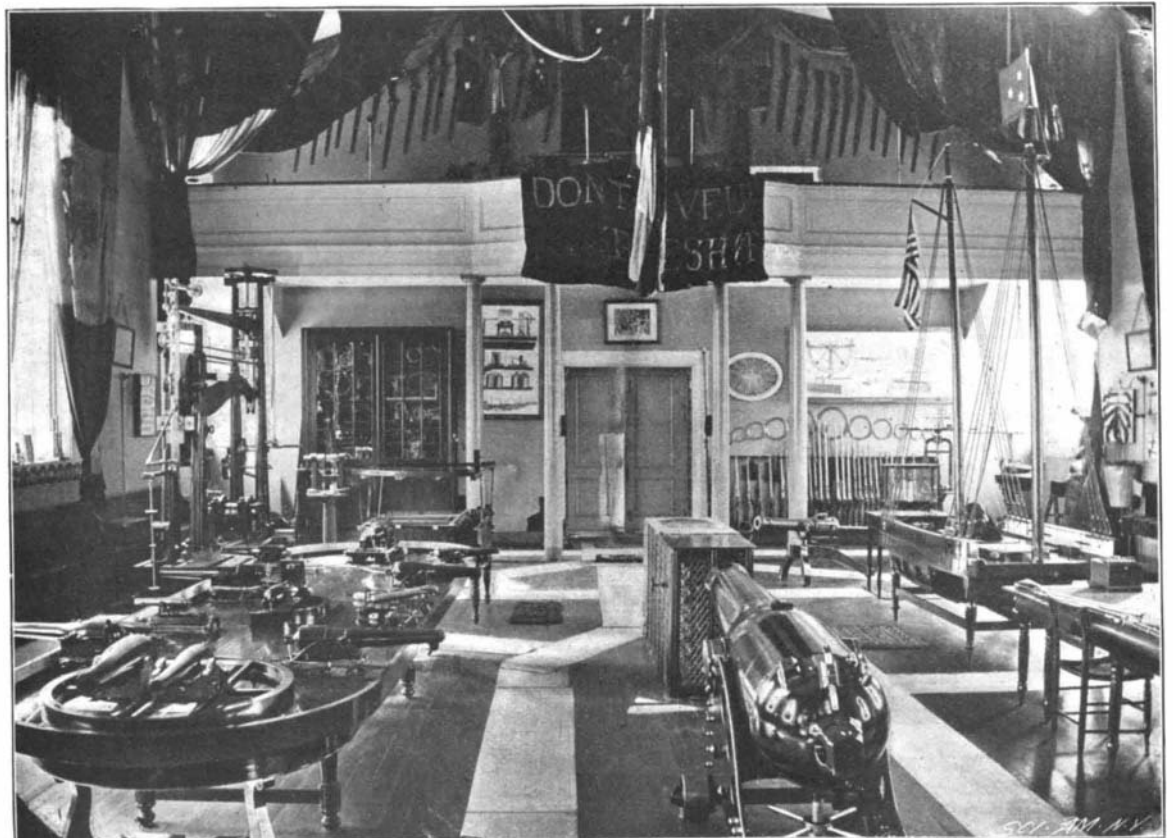
THE ACADEMY TRANSFORMED INTO AN ARMY HOSPITAL DURING THE CIVIL WAR.—From an old print.

where in the United States could have been found a site more appropriate for this purpose. The mild climate, suitable for outdoor drills all the year round, the quietude and dignity of the old colonial town, with the opportunities for intercourse with its refined and cultured society, all aid in forming from the embryonic naval cadet a courteous gentleman and a healthy, polished, efficient naval officer.

The original grounds of the Naval Academy were those of the military reservation of Fort Severn, which had been turned over to the Navy Department, and which consisted of about ten acres. This old fort, a relic of the war of 1812, and the only building of the original naval school that will survive the changes so soon to be begun, was long the dominating feature of the view in approaching the academy from the Chesapeake Bay. It stood at the angle of land formed by the entrance of the Severn River into the harbor of Annapolis and close to the water front, and consisted of a small circular rampart mounting "en barbette" eight heavy guns with a magazine in the center. The ground floor of the old fort was used as a storeroom after it became a part of the academy, and continued to be so used until the building was remodeled in 1895.

Stribling Row, leading from the gymnasium to the old Recitation Hall, was erected between the years 1851-56, and its buildings have been used for cadets' quarters from that time to the present. The western end, since the cadets' "new quarters" were built in 1867, is used by the paymaster's department as a storehouse, and the eastern end as the quarters of bachelor officers. Back of Stribling Row and the gymnasium, at the end of a long wharf that stretches out into the Severn River, lies the old dismantled frigate "Santee," in which the cadets of the fourth class, or "plebes," are quartered on entering the Academy and which is used as a place of confinement for cadets who misbehave during the academic year. In front of Stribling Row is a large campus, extending the whole length of the sea wall. Here the baseball and the football games are played and the cadets are drilled in infantry and artillery tactics.

of the old Recitation Hall. It was built in 1846-47, and enlarged in 1853. This was the mess hall of the early Academy and it was used as such during the stay of the Spanish officers when prisoners at Annapolis. An extensive and interesting collection of models used in the course of instruction in seamanship and naval architecture occupies a large portion of the build-



Photographs by M. M. Casler, Annapolis, Md.

LYCEUM USED AS GUNNERY ROOM (ORDNANCE DEPARTMENT).

room, a theater, and for the meeting of the Naval Institute. It now contains the nucleus of a museum of American naval trophies. Within the cases on the walls of the Lyceum is a large collection of British flags captured during the revolution and the war of 1812. Conspicuous among the flags is that which Commodore Perry hoisted at the battle of Lake Erie, bearing in large letters the famous words of the gallant Lawrence, "Don't give up the ship!" also the flag that "Old Ironsides," under command of Captain Hull, captured from the "Guerriere" in 1812.

Hanging from the ceiling are to be seen the Spanish flags captured by Admiral Dewey at the battle of Manila, those captured at the battle of Santiago and at Puerto Rico. Among the most interesting of these are the flag of Rear Admiral Montijo, the last one flown by the Spanish squadron at the battle of Manila Bay, from the cruiser "Don Antonio de Ulloa;" the flag of Admiral Cervera from the "Cristobal Colon," captured July 3; and the first Spanish flag hauled down in Puerto Rico by a detachment under command of Lieutenant Huse from the famous little "Gloucester," commanded by Lieutenant-Commander Wainwright, July 25, 1898.

Between the Lyceum and the Seamanship building stands one of the most picturesque ornaments of the Academy. It is the figurehead from the old United States frigate "Delaware," representing the bust of an Indian chief. The cadets have given the figure the nickname of the "God of 2.5," this being the mark out of a possible 4.0 that each cadet has to receive to be satisfactory in his studies and avoid being dropped or "bilged." There is a superstition firmly held by all under-graduates, that by making due obeisance, touching the cap in passing the old chief-tain, the requisite 2.5 may be assured. On the other side of the Lyceum stands the "Midshipmen's Monument," which was erected in 1848 by the midshipmen of the navy as a tribute of respect to four of their comrades, two of whom were lost with the United States brig "Somers," one wounded and the other killed in battle near Vera Cruz (1846-47). The accompanying illustration shows the members of the class of midshipmen of 1861 grouped around the monument. The central figure of the group is Admiral Sampson, who graduated at the head of this class.

A short distance from this monument is situated the "Observatory," a very unpretentious looking, old fashioned structure built in 1853.

In the center of the Academy grounds, surrounded by beautiful trees, stands an obelisk, erected to the memory of Captain Herndon, U. S. N., who, while on leave of absence, commanded the steamer "Central America," which was lost at sea. He preserved order, saved the lives of the women and children, and went down with his ship (September 12, 1857).

In front of the cadets' new quarters, flanked by a row of historic cannon captured in Mexico, is the monument erected by subscription among the naval officers to the memory of those who perished in the harbor of Tripoli in 1804. This monument originally stood in the Washington navy yard, and was mutilated by the British during their occupation of Washington in 1814.

With the exception of Fort Severn and a few residences to be remodeled, only one of the original buildings will be preserved. That structure is the Library building, in which is also situated the Superintendent's office.

The Naval Academy Library contains about 35,000 volumes. It is very broad in its character and includes books of all branches of literature.

Opposite the Library is the Chapel, built in 1868. In it are several beautiful memorial windows, and its walls are studded with several monuments to the good and brave, some of whom died in the peaceful branches of the naval profession, others who fell in battle or perished at sea.

The so-called "Cadets' New Quarters," where the first, third, and fourth classes are quartered, the second class being quartered in the buildings of Stribling Row, is the largest building in the present Academy. On the lower floor are the offices of the department of discipline, the mess hall, and several recitation rooms.

The Physical Laboratory and the Steam Engineering building, which face each other at the end of the main avenue, were built in 1866. The former was practically rebuilt in 1877, and, with the improvements made, is

now one of the best arranged and equipped laboratories in the country.

These, with the new residences for officers and professors erected in the last addition to the Academy on College Creek and Severn River, constitute the present Academy.

One time it seemed as though the work of reconstructing the Naval Academy would be indefinitely postponed or forever abandoned, but owing to the per-



TECUMSEH, THE INDIAN CHIEF. FIGUREHEAD OF THE U. S. SHIP "DELAWARE," 1817.

sistent efforts of Congressman Mudd and Senator Wellington, of Maryland, Congress appropriated at the close of the last session the necessary funds for carrying on the work of reconstruction on the plans proposed by Mr. Ernest Flagg. A contract for over two million dollars for the construction of a new sea wall, the Armory and the Power House has already been awarded, and the work has been actually begun.

One by one the old buildings will be demolished and new structures will take their places. Many are those who will regret the disappearance of the familiar landmarks of the Academy, which are replete with memories of the past. From their ruins, however, will rise an



BUCHANAN ROW.

institution which will contain the noblest buildings of any school of its kind in the world and be worthy of the great American nation.

THE brain of Helmholtz has been examined by Prof. Hausemann, of Vienna. It weighs above the average, but not remarkably so. The convolutions of the brain, however, were extraordinarily complex.

Novel Production of Vortex Motion.

BY C. S. STANFORD WEBSTER, F.I.C., F.C.S.

When the freshly gathered leaves of the native eucalyptus tree (*Eucalyptus globulus*) are ignited, they project vortex rings in considerable numbers in succession, accompanied by a spluttering noise. The best results are obtained by holding the scythe-shaped leaf vertically and igniting the apex, this being the part where the greatest number of translations are obtained. The leaves experimented upon were some very fine specimens of San Remo production.

Possibly, in the production of these vortex rings, blisters are first formed by the extrusion of the cuticular tissues, and, on the blisters bursting, air or aqueous vapor is spontaneously liberated, the rings being rendered visible on their contact with the smoke from the burning external portion of the leaf. The leaves of the small English variety of eucalyptus possess similar properties to the native product, but in a lesser degree, the rings projected being insignificant in size, comparatively speaking.

It is, of course, quite immaterial in the production of vortex rings whether the smoke or vapor be inside or outside the apparatus, as can easily be demonstrated by placing an empty Tait's apparatus (this consists of a box with a large round hole at one end, the other extremity being covered with a tense sheet of caoutchouc) suddenly in front of a dense cloud of ammonium chloride vapor, and striking the caoutchouc sheet at the same moment. A vortex ring is formed, being rendered visible after its translation through the vapor.

The author uses the vapor obtained by heating the solid ammonium chloride in preference to the usual method in which the two constituents are placed side by side, since the vapor thus obtained is not only denser, and more agreeable to work with, but can be kept under complete control.

If desired to fill the Tait's apparatus with the vapor, the solid is heated in a wide glass tube, one end of which is connected directly with the box by means of caoutchouc tubing, and to the other end a narrow glass tube is attached, and bent back parallel with the volatilizing tube, so that the same flame heats both simultaneously; this narrow tube then terminates in a long caoutchouc tube used for blowing into. By gently blowing into the glass apparatus the respired air is heated, and at the same time drives the volatilizing ammonium chloride into the box, which is quickly filled with the vapor.—Chemical News.

Date Palms for Arizona.

Dr. Zwingle, representing the Department of Agriculture of the United States, is now in Morocco on a mission which the department hopes will open a new and profitable industry in the most arid sections of our Southwest. It has been found that date palms with some irrigation will grow as well in Arizona as in Arabia. This was discovered many years ago, says the Evening Post, by early Mormon settlers, but the trees were not of the best variety, and date growing never developed as an industry. Now, however, the department is prepared to push the experiment on an extensive scale, and Dr. Zwingle is making a full study of the African date palm, selecting the very finest varieties and those best adapted to our arid region. Young trees will be shipped to Arizona and will be planted and cared for by experts from the department. They will cost about \$5 each laid down in Arizona.

The Bacteriology of a Railroad Car.

Accidents are not the only danger in railway traveling. Several years ago the bacilli of tuberculosis was discovered in a German railway carriage. Since that time Dr. Petri has carried on, in the laboratory of the Imperial Sanitary Bureau at Berlin, exhaustive researches on the presence of pathogenic bacilli in railway carriages. These reports showed that expectation was the chief source of danger. Of 91 animals which were inoculated with the sputum, 28, or 30.8 per cent, succumbed to disease produced by the inoculated material; the other 63 animals were killed at the end of six weeks, and of these three were found to be suffering from tuberculosis, manifestly due to the inoculation. The Prussian Minister of Public Works has now issued an order giving the proper method of cleaning and disinfecting railway carriages and platforms.

SCIENTIFIC AMERICAN

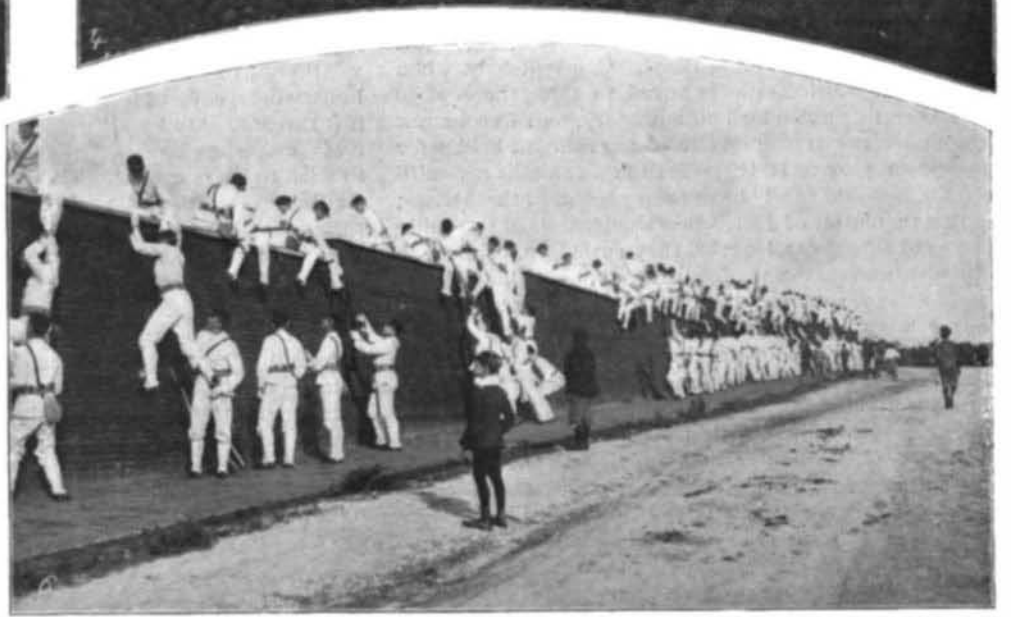
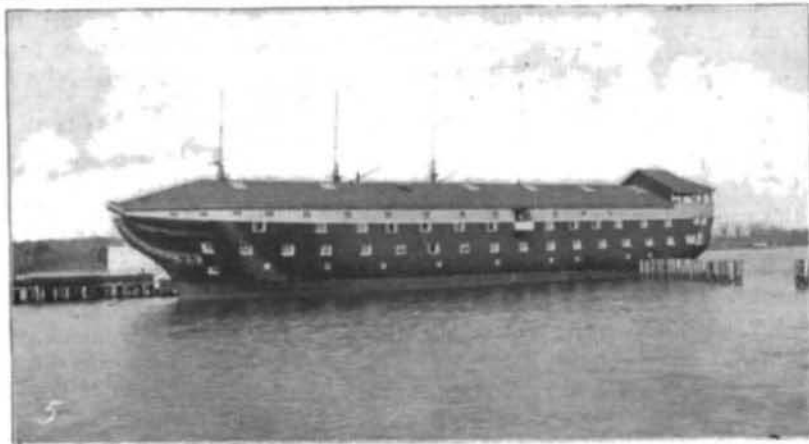
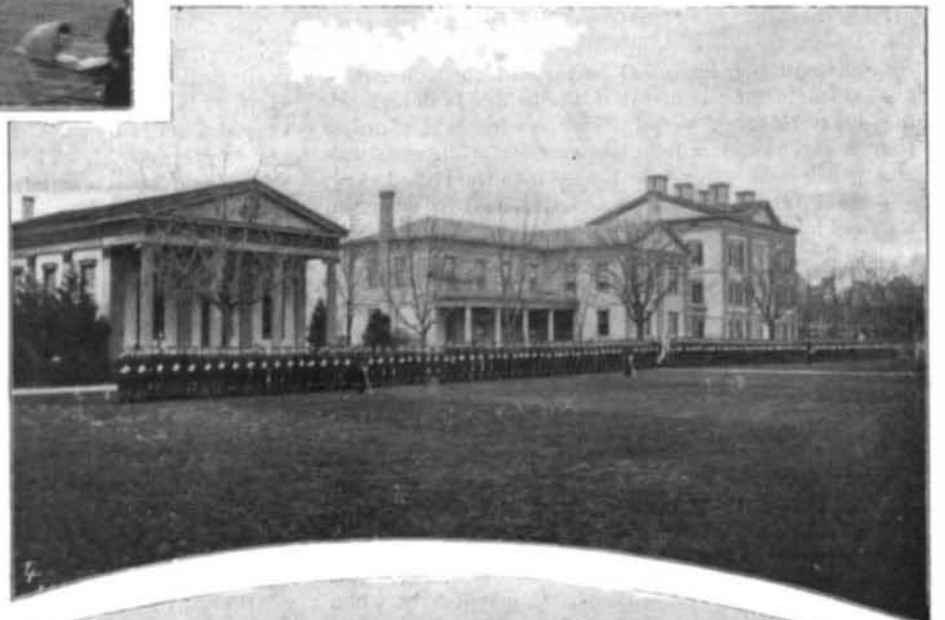
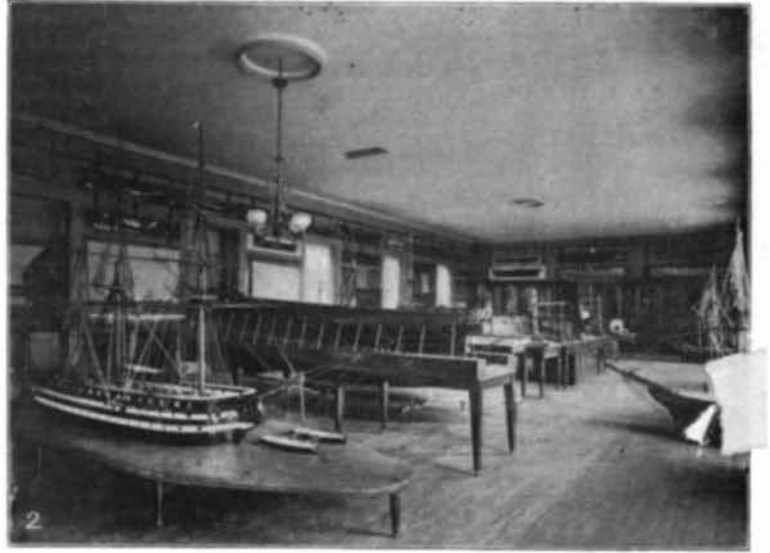
[Entered at the Post Office of New York, N. Y., as Second Class Matter. Copyright, 1899, by Munn & Co.]

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

Vol. LXXX.—No. 18.
ESTABLISHED 1845.

NEW YORK, MAY 6, 1899.

[\$3.00 A YEAR.
WEEKLY.]



Photographs by M. M. Casier, Annapolis, Md.

1. New cadets' quarters. 2. Seamanship department. 3. Gun deck U. S. S. "Santee." 4. Recitation Hall, Seamanship building, and United States Naval Institute building; cadets on dress parade. 5. The U. S. S. "Santee." 6. Scaling wall by naval cadets. 7. Stribling Row and Recitation Hall.

UNITED STATES NAVAL ACADEMY, ANNAPOLIS.—[See page 283.]