#### ABOUT NAVAL ARCHITECTURE.

Development Through Progressive Changes of Facilities of Water Transportation.

FROM THE DUG OUT TO THE STEAMBOAT,

Typical Vescels of Various Countries "Times and People Contrasted with Those of Modern Construction.

The perils incident to the pavigation of Takes and streams of any considerable magnitude a few centuries ago were sufficient to test the courage of the boldest and bravest, but the real and imaginary dangers that confronted the mariner who ventured in his frait barque upon the unknown open sea were apdalling. To cross and recross the Atlantic is now a pastime-a journey as safe and swift as one covering the same distance on land. But in the time of Columbus it was altogether a different affair, and we can never sufficiently admire the moral fortitude and grandure of purpose which inspired and sustained that heroic navagator (contemptuously regarded as a "crank" by the wise men and derided as a fool by the igrorant of his day and genera tion) who, after overcoming the intrigues of a hostile court, by the aid of Queen Isabelia set sail at last, and in spite of adverse winds

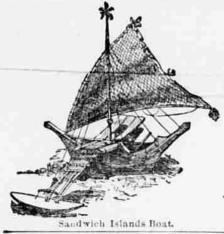


The caravel Santa Maris, from a wood engraving of 1483, on a design by Columbus, himself.

and a mutinous crew completed his first

transatlantic voyage with results so start-ling and stupendous.

The international exposition of 1893, to be heid in Chicago, (named Columbian in his honor) will be a worthy tribute to his genius and life work. One of the happiest features among single ex-habits, will be the exact reproduction in habits, will be the exact reproduction in size, form and equiptment down to the minutest detail of the famous vessel (above illustrated), from whose deck Columbus caught the first glimpse of the shores of the new world. This precious souvenier after being welcomed on its arrival from Genoa with due honors in New Yors harbor, and making the passage of the lakes to Chicago, will be assigned to the department of transwill be assigned to the department of trans-



portation exhibits during the World's Columbian exposition. The classification of this department includes vessels of every type and description, ancient and modern.

The plans of this exhibition are not to be limited to merely a competitive display of the finest specimens and models of shos, steamers, yachts, boats, etc., of the latest improved construction, but is intended to show in a realistic way the methods of water conveyance peculiar to all countries from the most enlightened to the semi-civilized and barbarous. A series of object lessons in chronological order will punctuate each progressive step in naval architecture from the crude attempts of primative boat builders to the stately steamships and ironclads of today. Such an arrangement of naval special-ties and curiosities will not only gratify the sight-seer, but possess a historical and educational suggestiveness that will invest them with far more than ordinary interest. A similar judicious plan will be adopted in the grouping of articles belonging to the



other two distinctive classifications of this department, comprising railways, their operations and equipment, and vehicles on com-

mon roads. The continent of North America from the nate of its first settlement by white men will alone furnish material for an ample and varied collection of naval curios. The aborigines did not lack the facilities to ascend rivers or paddle over lakes on their hunting and fish-ing excursions. The dugout, laboriously hewn with shells or burned out of a solid log, the birch bark canoe, and the coracle, the latter consisting of wicker frame work covered with skins, were their chief



means of water transportation, and at first (for lack of anything better) the whites were not slow to adopt Indian meth-ods. Some of their cances were by no means nsignificant affairs. The Iroquets made them from twelve to forty feet long, with a capacity for carrying twelve to forty men. The Unippewas used the rind of one birch tree, shaping it to a graceful model and sewing it with tamarack roots. When Columbus landed at the West Indies Voyage Indian he was vis-trader in a fourth



cance eight feet wide formed out of a single tree and and propelled by twenty-five rowers. The cances of many western tribes were frames of osier or flexible poles covered with

buffalo skins sewed together with the sinews

of the deer.

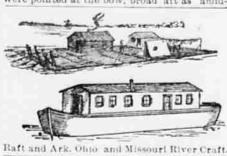
On the Atlantic coast, canoes were used extensively by the first European settlers for collecting systems and clams. In time the shallop came into use, then the sloop and pinks. But the largest vessel of the Sixteenth and Seventeenth centuries were comparatively of small dimensions, very few being over one hundred tons burthen. The waters of Maine were explored in one bark of fifty and another of twenty-six tons. John Smith penetrated the rivers and bays of territory now known as



Virginia and Maryland in a long loat of twenty tons and two ressels of forty to 100 tons. A record of traft in Massachusetts from 1674 to 1714 and Maryland designates them as "sloops, pinks, ketches, brigantines, barnes and ships," of which sloops were the most numerous. But prior to the revolution, ship building in the colonies had attained a considerable magnitude.

heir vessels of all classes in 1869 aggregat-ng over 20,000 tons.

The cance ultimately gave place to the batteau or broad bottom skiff on the interior waters of the United States. These boats were pointed at the bow, broad aft as amid-



ships and flat on the floor with upright sides. These are still in service on the Aroostock (Mo.) river.

Then followed the array of flat boats and "broad horns" (the latter for coal), rafts, arks, etc., exclusively adapted to descending river navigation—the great bulk of the carrying business from head waters to New Organs being effected in this way. For ascending rying business from head waters to New Orleans being effected in this way. For ascending streams keel boats were provided. Arks
and rafts played a conspicuous and important part in the transportation of
heavy material, live stock, etc., the
farmers of central and western
New York, before the construction of the
Erie canal, sending their produce to markets
in Arkansas down the Delewage and Susana. n Arkansas down the Deleware and Susque-innna rivers. Keel boats covered in with



cabins for passengers were called "barges. Some of these were seventy to 100 feet long and sixty to 100 tons capacity. Team boats for crossing ferries of eight horse power were

in use from 1814 to 1824.

Early canal projects made slow headway.
The completion of the Eric canal, however, in 1825, and its success both financially and as a great artery of commerce stimulated the construction of similar enterprises else-where, especially in Pennsylvania and New Jersey. But the first successful application of steam as a motor by Robert Fulton in 1807 (who made an initial trip in the Clermont up the Hudson a distance of miles in twenty-four hours) revolutionized existing methods of transpor-tation and travel. The first steamboat on western waters, the Enterprise, made its trial trip from Pittsburg to New Orleans, and was subsequently (in 1814) wrecked near Natchez. We confidently expect to see nodels of some of the original stern wheelers of which these vessels were the type, at the ming exposition.

coming exposition.

The record of steamboat construction from 1830 to 1841 showed an increase that more than doubled all previous efforts, the tonnage of steamers in 1838 being about equally divided between high pressure and law pressure engines. The former were almost exclusively used in the Migrisgian values with the contract of t Mississippi valley, while on the Atuntic coast the latter has been generally adhered



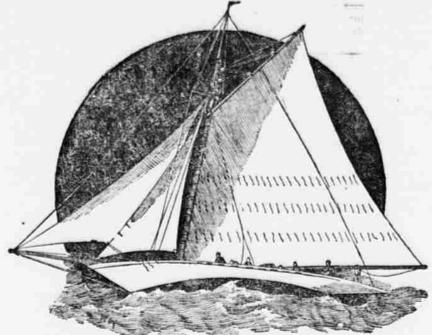
The speed, size and strength of the Hudson river and Long island steamers had een materially increased. The Albany 1832) was 272 feet long, twenty-six and one oalf feet beam and registered 588 tons. The Massachusett (traversing Long Island Sound), was 202 feet long, twenty-nine feet beam and of 676 tens.

Meanwhile the vessels plving between Atlantic and foreign ports had also greatly acreased in numbers and efficiency. An increased in numbers and efficiency. An American merchantman of 1,13 tons in 1841 was said to be the largest in the world. In 1850 vessels of 2,000 tons were not uncom The Republic (1853) had a tonnage of From 1840 to 1860 the finest salling vessels were built for ocean service, making remarkable swift voyages between English and Atlantic scaperts and China, Australia

and Pacific coast points. It was a period especially active and eventful in matters bearing on all classes of navigation interests, most important changes being due to the suc-essful application of the screw by Ericson. In 1840 the Cunard line was established. In N51 as many as fifteen companies (sixty-three steamers, 111,4% tons) were running lines between New York and London and

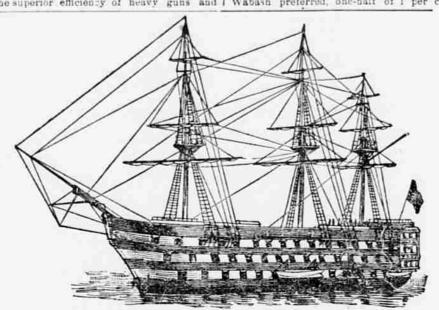
England, it was thought that fall saling had reached its limit. But this belief was signally dispelled by subsequent races, notably that between the Genesta and Puritar for the same prize. Then the conviction became general that vessels of the Burgess model could outfoot any craft of its class that could be designed.

But to the utter amazement of rachtmen and shipbuilders, one Herreshoff steps to the front with the Gioriana, a strikingly unique and bold departure from all precedents in



lines, build and rigging—at present conceded to be the fastest yacht allout. The international regattas heid in this and foreign waters have been fruitful in good results. Aside from the gratification afforded by a contest honorably conducted, every suggestion of improvement in strength, speed and beauty which such races determine, are eagerly caught up and incorporated in naval construction on a large scale.

The Monitor and Merrimac duel demonstrated for the first time in a national combat the superior efficiency of heavy guns and the superior efficiency of heavy guns



The Victory, Nelson's Flag Ship.

been the pride and glory of England, were so much useless timber. Such illustrious vessels as the Victory, the Constitution, the Hart-ford and others still exist as faithful re-minders of patriotic duty nobly performed. Their splendid records have glorified history

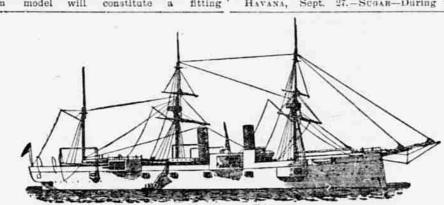
and their reproduction in model will prove a profoundly interesting feature.

The "buge leviathans," representing the battle ships of modern times, with their stupendous armaments, among which the sinope (Russia...), Koenig Wilhelm (German), Admiral Bandin (French), the Chicago (United State.) are worthy examples, torpedo and mortar boats, floating batteries for coast or harbor defenses, etc., in model will constitute a fitting

armor plates in naval warfare. Thenceforth each: Canadian Pacific was neglected the "wooden hulls," which for centuries had been the pride and glory of England, were so gained 2 per ceut of the week. The securi ties on the Mexican railway were in better

Foreigners were steady but there was little inclination to deal pending the arrangement for the Russian loan. Paris financiers an-parently do not like to float the issue unparently do not like to float the issue unaided, and evidently begin to find the hope of German assistance dubious. Argentine declined 3 per cent on the week, Brazilians one naif of 1 per cent, and Portuguese five-eighths of 1 per cent. Among the miscellaneous securities Angio-American Telegraph shares fell one-half of 1 per cent, Eastmans three-eighths of 1 per cent and Elmore Copper one-fourth of 1 per cent.

HAVANA, Sept. 27.—SUGAR—During the



The Steel Cruiser Chicago. climax and close to a series of obweek holders made concessions and heavy

ject lessons incomparably superior to any similar collection heretofore made in exposilons of an international or even strictly mar time character.
Persons or ship building firms throughout the world who are interested in a line of marine exhibits, including vessels of every description, ancient or modern, and have any-

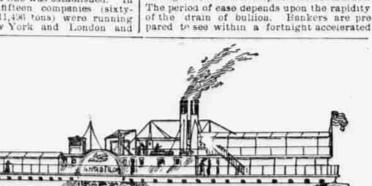
thing relating thereto of special interest to communicate, should write to the department of transportation exhibits of the World's Columbian exposition. Information of this kind will be heartily welcomed, as every effort is to be made to make the exhibition ooth interesting and instructive. FOREIGN FINANCIAL REVIEW.

Discount Was Unusually Quiet Dur-

ing the Past Week. London, Sept. 27 .- Discount was quiet during the past week at 25% per cent for three months, and 1% per cent for short. Money is still plentiful, but discount houses hold can exchange, and further withdrawl of gold

out for full rates in view of a fall in Amerifor New York. A tightening of rates is certain, though the process will be gradual the Bank of England having an unusually arge reserve. A part of the government dividends about

falling due, will also help to ease the market



In connection with models, photographs and sketches illustrating the many changes in construction, equipment and propulsive devices which have marked the important transitive periods above briefly referred to, the reproduction of designs and improvements adapted to the production of life and property on the seas, buoys, signals, light-houses, docks, wrecking apparatus and ap-

pliances, will be hardly less interesting.
In the modern yacht, ship building has attained its nighest perfection as a fine art, and maintains a leading place in naval archi-tecture. To other vessels it is what the thoroughbred is to the ordinary roadster. Human genius and constructive skill were stimulated to their utmost by competitive tests in which the victor is crowned with honors and substantial rewards. When, in 1851, the America captured the international cup from the royal yacht squadron of

Liverpool. In the United States there was a corresponding increase in size and splendor of river and lake steamboats, the Hudson fiver boats attaining an acknowledged superiority over all other vessels of their class in the world.

In connection with models photographs vember. Discounters are averse to dealing in long bills. The Stock exchange experienced a decided reaction under the influence of the Gould operations. Early in the week the boom preceded merely with no indica-tion of a check to its prosperity until Thurs-day's news that the Missouri Pacific divi-dend would be deferred shook the market. The reaction was due more to a dread of cou

> Dealers on the Stock exchange, for a time, braced themselves, prepared to face a succes-sion of bad news from all over, while weak operations actively realized, thus assisting the general set-back. But the confidence of the public and investors, appeared unshaken and although current buying abated, holders generally showed no disposition to unload. The depression ceased yesterlay on the resumption of New York buying, and the

sales were effected. The market closed with a moderately active demand, especially for lower grades, and rather weak. Molasses sugar, regular to good polarization, \$2.183, gold per quintal; Muscovaso, fair to good refinery, \$5 to \$7 degrees, \$200,224c; centrifu ral, 91 to 96 degrees polarization, in hogs heads, bags and boxes, \$2.814673.0614 Stocks in warehouses at Havana and Matan zas, 28 boxes, 777,000 bags and 1,300 hogs heads; receipts from the 7th to the 23d, 281 bags; exports, 1 box, 34,000 bags, of which 32,000 bags to the United States. Bacon \$12.75 gold per cwt. BUTTER-Superior American, \$2.04 gold per

FLOUR-American, \$13.00 gold per barrel. JERRED BEEF - \$3.50 gold per quinta'. HAMS - American sugar cured, \$12.00 gold per quintal for northern, \$18.00 for southern LARD-In kegs, \$10.00 gold per quintal; in tins, \$12.00.

POTATORS-American, \$3.3714 gold per bar-LUMBER-Nominal. SHOOKS-Nominal. BEANS-White navy, \$6.00 gold per quintal. CHEWING TOBACCO-\$24.00 gold per quintal FREIGHTS-Quiet.

Exchange—Quiet, Spanish Gold—\$2.334@2.34. On the Paris Bourse. PARIS, Sept. 27 .- On the Bourse during the week, business was quiet, but prices were firm. Three per cent rentes advanced 50 cents, and Bank of France, 151, while Credit Foncier declined 14f, and Rio Tins to, to 15f, 7 centimes. Credit foncier is about to issue its sixth loan of 400,000,000f in bonds of 400f, each, which are offered at 380f. Until these are subscribed for the new Russian loan will probably be postponed.

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