

# Testing War Ship Models

For over fifteen years Rear Admiral Hitchborn, chief of the construction bureau of the navy, has been endeavoring to secure the building of an experimental naval basin. He was sent abroad by Secretary Chandler as far back as 1884 to see what improvements had been devised in shipbuilding by other countries, and came back with the idea for this in his brain. But it was not until toward the close of the Fifty-fourth congress that he was able to secure an appropriation of the necessary \$150,000 to put his plans into operation.

The need of such tanks has been recognized abroad for a still longer time, but the governments have hesitated to go into it sufficiently to attain the best results. Mr. William Denny, the most progressive of the Scotch builders, and the owner of the only private basin in the world, said recently, in discussing the question: "Of all the problems about a steamship, the only ones incapable of being solved at the present moment by a prior method are those relating to speed and power. No ability and no training will enable even the most skillful naval architect to overcome the want of an experimental tank in coping with these questions."

It is to find out this ideal hull, the one that will attain the maximum result of speed, of carrying power, or of whatever other quality that may be desired—that the United States has erected after many years of solicitation on the part of the Bureau of Construction and Repair this enormous basin.

The basin was authorized by congress two years ago, and already partial experiments have been made with a model of the Iowa, and the basin has been proved to be thoroughly accurate in its predictions in regard to speed. Very soon exhaustive experiments will be begun to determine the best shapes for the hulls of the new war ships authorized last March.

### A Mechanical Wonder.

The tank has a length of 500 feet and along each of its long sides is laid a railway on which runs a "towing carriage," which extends like a bridge over the tank from side to side. When the great weight of the carriage (twenty-five tons) is taken into consideration, as well as the rapidity with which it moves, and the perfect control under which it operates at all times, it will be easily understood that the whole process of operation is little short of marvellous. In fact the motor carriage of the model basin is a mechanical and electrical wonder and a thing almost entirely unique. On it is a complicated piece of machinery, worked by the Ward-Leonard system of electrical control, capable of driving the carriage along the rails at twenty-five miles an hour within 200 feet of the starting place.

Hung to this bridge carriage by means of a dynamometer will be the various models which it is designed to test, each loaded so

entire bow under the water, thus offering a much greater surface to the water and increasing the resistance to its passage. It is evident that portions of the bow which are well out of the water at ten knots—the maximum speed attainable in any of the European tanks—will be submerged entirely at twenty knots, and that as much care should be taken to design so as to offer the least resistance of the upper portion to the water as is taken with the lower portions, which are always submerged. Yet never in the history of the world has it been possible to ascertain the best shape for them in advance of actual test after the ship has been completed, when, of course, it is too late for alterations.

Objections may be made that the tank offers, after all, only smooth water facilities, and will not give evidence as to work in a sea way. Such, however, is not the case. At one end of the tank is to be placed a powerful propeller, which will send waves to meet the model quite as strong proportionately to the size as are likely to be encountered by the ship in the open sea. Further, in one corner of the building which encloses the entire tank will be placed a powerful electric fan, which can get up a very good imitation of a gale of wind.

### Proving the Tests.

All these points were worked out very carefully by Naval Constructor David W. Taylor before the building of the plant was begun, and there was theoretically no doubt that all would work correctly. Still, careful tests were determined upon to show that these calculations were accurate. In other words, to make everything perfectly safe, the "sum" had to be "proved."

For this purpose models have been, or are being, constructed of the Iowa, the Brooklyn, the Raleigh, and other vessels at present in existence. Abundant records, of course, exist as to the speed of these actual vessels in all sorts of weather and under all conditions. If, when their models are tested in the tank, they should give results which, when worked out, should agree with the results in actual practice, it would be proof that other ships built on models obtained in the tank would also give the expected results. If, on the other hand, it were found that the results were somewhat different, they would give a basis for calculating the amount by which the final ship should be made to differ from the tank model.

Naturally, Mr. Taylor felt more or less anxiety in regard to the first experiment. This was made with a twenty-foot wooden model of the Iowa, double the length of any model used abroad. So far this has been tested at various speeds up to twelve knots and the results have been practically identical with those shown by the Iowa's log books. In a few days experiments will be made at greater speeds. At present the machinery is so new that it is not thought

sary to construct a new yacht to defend the international trophy now in possession of an American built vessel.

## A Genuine North American Cyrano

The demand for Rostand's great work, "Cyrano de Bergerac," has in no way been decreased by the presentation of the play in Omaha some weeks ago by one of America's greatest actors. On the contrary, Mr. Mansfield's production of the

seem, is a loyal member of the Kiowa tribe of Apache Indians. The photograph was taken during the Indian congress held at the Transmississippi Exposition last summer, in which Diaz was a representative of the tribe of Kiowas.

The life of Pablino Diaz, as the original of the portrait is named, has been more than usually adventurous. He was born in Old Mexico of Mexican parents, and when 7 years of age was captured by a roving band of Kiowas who had crossed the Rio Grande and invaded Mexico on a marauding expedition. The boy was visit-

if they are still alive, but always without success. "And," he adds with a laugh, "my brother, the president of Mexico, would hardly care to recognize me now." This is a joke he loves to repeat to all who hear his story.

Diaz is exceptionally bright and his voice has great weight in the councils of his tribe. He has been made a chief, subordinate only to the head man of the tribe, who, too, has great respect for the opinions of his Mexican fellow tribesman.

Mr. F. A. Rinehart first noticed the peculiarity of this North American Cyrano, and during Mr. Mansfield's visit to Omaha presented him with a print. Mr. Mansfield's acknowledgment is reproduced in this issue.

## A Strange Fly Trap

Flytraps are well known in the animal Kingdom to every one who has eyes, or, at least, who uses them.

The delicate web of the spider and the deeply cut and broad mouth of the swallow at once suggest themselves. But that a vegetable should have an exquisitely constructed and perfect apparatus of this kind, reports the Philadelphia Press, is very remarkable, when it is remembered that plants differ markedly from animals in regard to their food. For, while animals live on organic substances—that is, on plants or other animals—vegetables live on inorganic substances.

It is, then, unlikely that a fly could supply a plant with food, and yet a more perfect flytrap than the leaves of *dionea* cannot be imagined.

This little plant is a native of the sandy bogs in the pine barrens of Carolina. It grows to a height of from six to twelve inches, producing a loose head of large whitish flowers, not unlike the flower of the lady's smock.

The flower stalk rises from a rosette of yellowish green leaves, spreading on the ground. Each leaf is divided by a deep incision into two portions, the lower being a broadly-winged foot stalk, and the upper the blade or true leaf itself.

This upper portion is the flytrap—the most curious part of the plant—and demands a careful description.

It is roundish, and divided into two equal parts by a strong mid-rib. The margins are fringed with a row of strong spiny bristles, so that it may be likened to two upper eyelids joined at their bases. The leaf is a little hollow on either side of the mid-rib, the upper surface is dotted with minute reddish glands, and each hollow is furnished with three slender bristles. The sensitiveness of the leaf chiefly lies in these bristles. If an insect alights on the leaf and touches one or more of them the sides suddenly close with a force so great as to imprison the little creature, notwithstanding all its efforts to escape. The fringe of bristles on the opposite side of the leaf interlace like the fingers of the two hands clasped together, or like the teeth of a steel trap.

The insect is not crushed or suddenly destroyed, but is retained firmly imprisoned until it ceases to move, which would mean until it was dead, and then the leaf slowly expands.

The two lobes are enfolded at night, but spread open in the day. When the bristles are irritated by man, the leaf quickly closes, remains closed for a short time, then slowly expands, ready to close again if newly irritated.

But if it be caused to make repeated efforts at short intervals, its movements become languid, or the sensibility is altogether exhausted and is recovered only by a period of repose.

## Fooling Kit Carson

Kit Carson's rifle, which was carried by him for more than forty years, and which never failed him, is now a precious relic in the possession of the Montezuma lodge of Masons at Santa Fe, of which he was a member, relates the Chicago Record.

As an Indian fighter Carson was matchless, and no one understood better than he the habits and the nature of the savage. He told Colonel Inman of Kansas that he was deceived but once by Indian tactics. He said that he was hunting with six others after buffalo in the summer of 1835; that they had been successful and came into their little bivouac one night very tired, intending to start for the rendezvous at Bent's fort the next morning. They had a number of dogs, among them some excellent animals. These barked a good deal and seemed restless, and the men heard wolves.

"I saw," said Kit, "two big wolves sneaking about, one of them quite close to us. Gordon, one of my men, wanted to fire his rifle at it, but I did not let him, for fear he would hit a dog. I admit that I had a sort of idea that these wolves might be Indians, but when I noticed one of them turn short around and heard the clashing of his teeth as he rushed at one of the dogs I felt easy then, and was certain that they were wolves sure enough. But the red devil fooled me after all, for he had two dried buffalo bones in his hands under the wolf-skin, and he rattled them together every time he turned to make a dash at the dogs. Well, by and by we all dozed off, and it wasn't long before I was suddenly aroused by a noise and a big blaze. I rushed out the first thing for our mules and held them. If the savages had been at all smart they could have killed us in a trice, but they ran as soon as they fired at us. They killed one of my men, putting five bullets in his body and eight in his buffalo robe. The Indians were a band of Sioux on the war trail after a band of Snakes, and found us by sheer accident. They endeavored to ambush us the next morning, but we got wind of their little game and killed three of them, including the chief."



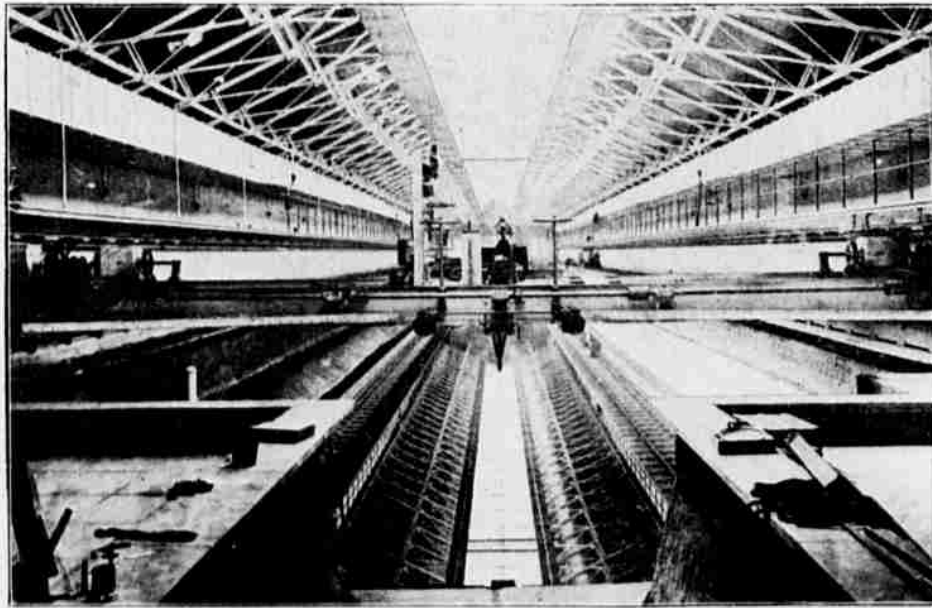
PABLINO DIAZ, A NORTH AMERICAN CYRANO.

work of the great French master has only served to increase this demand and heighten the interest taken in the book.

Those who were fortunate enough to enjoy Mr. Mansfield's most excellent production will readily recognize the similarity between his clever makeup and the likeness of a North American Cyrano pre-

ing his uncle's ranch at the time, and being a lover of horses, had gone to the pasture where the animals were grazing. The sharp eyes of the Indians, swooping down to drive off the stock, soon sighted the boyish figure and he was captured with much difficulty. He was brought with the band to the camping grounds of the

### PRIVATE CAR 80.



MIMIC OCEAN FOR TESTING WAR SHIPS.

as to float the exact proportionate depth designed for the ship. As the carriage sweeps along, towing the model, the dynamometer will register the resistance of the water to that particular form of bow at each speed from one knot an hour up to thirty. If it is found that the resistance is greater than it should be the model will be taken back to the carpentering establishment attached to the basin and trimmed down or built out, as may be thought best, and then tried again and again until the very best shape for the purpose intended is resolved upon.

### Noting Resistance.

When one is finally adopted, the resistance of the water to its progress at various speeds will be carefully noted, and from this it will be very simple to calculate the exact power of the engines required to give the ship, when built, the greatest speed. Hereafter there will be no danger that the engines will be found too weak for the ship, thus losing speed, or too heavy and strong, thus losing weight that might better be devoted to some other part of the vessel.

There is one especial advantage in the high speed that can be attained in the tank which a layman will necessarily overlook. It results from the tendency of a ship to bore downwards in the water. The faster it goes the deeper it will bore, the more of it will be submerged and the larger will be its displacement. For instance, the coast defense vessel Monterey, when running at full speed, plunges its

prudent to use too great velocity. As the various parts get adjusted to each other and the machinery, so to speak, "finds" itself, the speeds will be increased till they reach the maximum. At present everything is rough and discordant and makes a great deal of noise. This, the men in charge say, will soon wear off.

The model ship is near the great tank and there are now half a dozen models under construction in it, both those of existing war ships and those of contemplated ones. It is not proposed to try any of the latter class for two months yet, the time until then being occupied in testing existing vessels. At the end of that interval it is probable that there will be a public test of the tank and an official explanation of its uses. At present the officers are somewhat close-mouthed in regard to it.

It is also the intention of the government to allow American shipbuilding firms and private parties to have the use of the model basin whenever it is not in use on government tests. The models will be constructed after any pattern that the parties in question may desire to submit and only the actual cost of the work of constructing and testing these models will be charged. It is expected that the future American cup defenders will be first tested in miniature in the United States model basin before their actual work of construction is entered upon. It will be a matter of great nautical interest to watch and note the improvements that will thus be effected in their speed from time to time when it becomes neces-

sented in this issue of The Illustrated Bee. In fact, the portrait reproduced may be said to some extent to excel that of Mr. Mansfield's Cyrano, in that it is entirely natural. The interest is not lessened by the fact that the portrait is that of a full-blooded Mexican, who, strange as it may

be, and after a time formally adopted by them. He says that his captors always treated him kindly and that very soon he was looked upon as a full-blooded member of the tribe.

Of late years he has made repeated efforts to discover the whereabouts of his parents,

*W. Richard Mansfield  
begs to thank W. Richard  
as much for his interesting  
picture of the North  
American 'Cyrano'.  
Omaha, May, 23.*