Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT

No. 361 BROADWAY, NEW YORK.

O. D. MUNN. A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

One copy, one year, for the U. S., Canada or Mexico.....$3 00
One copy, six months, for the U. S., Canada or Mexico..... 1 50
One copy, one year, to any foreign country belonging to Postal Union. 4 00
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MUNN & CO., 361 Broadway, corner of Franklin Street, New York.

The Scientific American Supplement

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NEW YORK, SATURDAY, NOVEMBER 4, 1893.

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(Illustrated articles are marked with an asterisk.)

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SCIENTIFIC AMERICAN SUPPLEMENT

No. 931.

For the Week Ending November 4, 1893.

Price 10 cents. For sale by all newsdealers

CLOSING OF THE WORLD'S COLUMBIAN EXPOSITION.

When our readers shall have received this paper the Chicago exhibition will be no more. After months of debate, after suggestions as to the city where it should be held, after criticisms and congratulations innumerable following the decision as to site, Chicago may justly claim to have honored herself and the United States by her achievements. In a time unprecedentedly limited when compared to the work to be done, the buildings were erected and the Fair was opened at the appointed date. From the sea of mud, as the ground was described in its early winter and spring days, the lovely Jackson Park, with its beautiful landscape and floral features and its Venice-like lagoons, blossomed into being. The great buildings rose in their places, the fountains and statuary were installed, and the White City appropriately graced its surroundings.

In many ways the Fair was an innovation. The combination of landscape and waterscape was new. The great area occupied necessitated adequate means of transportation within the grounds. The buildings, too, were so large as to make it hard to see them satisfactorily. Accordingly the waters of the lake were utilized, and the water transportation within the grounds became one of the features. Bringing old and new together, gondolas from Venice competed with electric launches in this service.

The Fair grounds and buildings were not merely a receptacle for exhibits. By the efforts of the best architects and artists of our nation the buildings and statuary became the best exhibit. Unsurpassed by man when their size is considered, the great buildings have received numerous encomiums from all critics from the art standpoint. The statuary on them and distributed through the grounds was another feature of great attractiveness. Thus having provided a true world's pleasure ground, Chicago drew upon the treasures of the globe for its adornment with exhibits. But, in the opinion of many, the work of Chicago (the grounds and buildings) surpassed their contents (the exhibits). This marked a recent innovation, for the artistic side has usually been esteemed as of secondary importance in the buildings and grounds of World's Fairs. Paris, in 1889, set an example which Chicago, in 1893, followed to its proper conclusion.

The system of concessions, as carried out upon the Midway Plaisance, introduced the spectacular element, but of a character of real value. Never before had the different nations of the world had so impressive a showing—no such practical lessons in anthropology have ever been given. The attendance at the Fair has been one of its wonders. A thousand miles from the seaboard, its situation seemed to militate against it. But thirty-seven railroads, with over seventy-six thousand miles of track, center in Chicago. Without a change of cars, almost any inhabitant of the continent could reach the Fair on some of these lines.

At World's Fairs it has become the custom to have days devoted to or in honor of special occasions, States, cities, or countries. These are signalized usually by a greater attendance than usual. At Chicago we find a record of 128,965 paid admissions on opening day, 283,273 on the Fourth of July, 160,382 on New York day and 243,951 on Illinois day. These records appear small if contrasted with the October attendance, when the daily visitors varied from 128,196 on October 2 to the magnificent and unprecedented number of 716,881 on October 9, Chicago day. As the Fair was reaching its close, the city of New York felt that it should congratulate its sister, and on October 21 Manhattan day was celebrated. The mayor of New York and other representative dignitaries visited Chicago and participated in the ceremonies of the occasion. The attendance was 298,928.

These attendances may be contrasted with Paris and Philadelphia. The greatest day's attendance at the Philadelphia Exposition of 1876 was 217,526; at the Paris Exposition of 1889, it was 397,150. Thus Chicago on her own day almost doubled the Paris and almost trebled the Philadelphia figures.

The total attendance of some twenty-one millions is, however, inferior to that of the Paris Fair of 1889, where 28,149,353 visitors were recorded, although the Chicago Fair occupied six times the area of ground and had five times the area roofed compared with this Exposition. The visitors increased in number as month after month passed by. In May 1,050,037 are recorded. This was at the time a great disappointment. But when June showed 2,675,113, expectations began to be brighter, and the succeeding months showed 2,760,263 for July, 3,515,493 for August, 4,659,871 for September, and about seven millions for October. Thus the entire attendance for the opening month was almost the same as that of two days in October—Chicago and Manhattan days. If Chicago were a little further south and if its Fair had another month of life, the attendance would probably reach thirty millions.

And now it passes into history as one of the world's wonders, as one of man's greatest achievements, something that the present generation can hardly hope to see equaled.

COALING CRUISERS AT SEA.

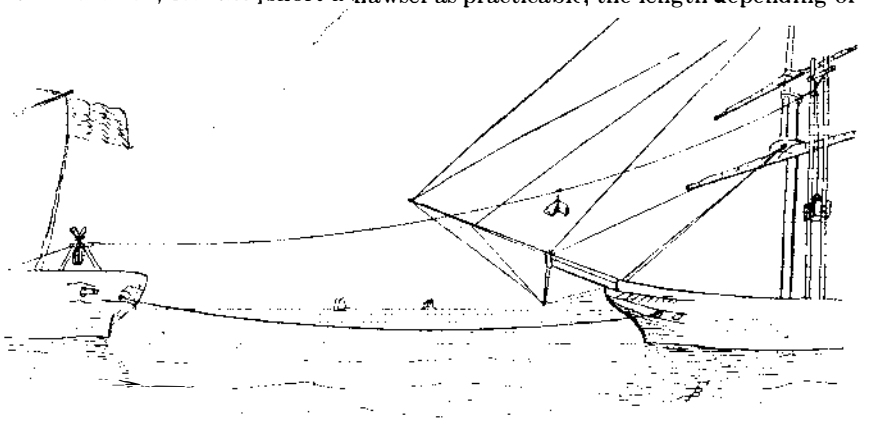
During the war of the rebellion we kept a large fleet of vessels on blockading duty. They were often obliged to keep the sea for long periods of time, especially off the Carolina coasts, and the question of methods of supplying them with provisions and coal was one which engaged the earnest thought of the Navy Department and naval officers in general.

Provision transports were sent from Northern ports, and though usually successful in delivering their freight to the blockading fleet, yet occasionally they met with disaster and frequently with delay. The principal difficulty was in transferring the coal, the motions of the two ships, even in a small sea, rendering the operation difficult and dangerous.

A solution of the problem of coaling ships at sea has been sought ever since, and many devices have been brought forth by inventors both in and outside of the navy. The solution is particularly valuable to the United States in view of the fact that we have no coaling stations. In case of foreign naval operations we would be obliged to send colliers, and our cruisers would probably have to take the coal from them while at sea or outside of the marine league.

Recently the Navy Department ordered two of the North Atlantic fleet to be equipped and rigged to try the experiment of coaling at sea after a new plan. The ships detailed for this purpose were the flagship San Francisco, which represented the cruiser, and th United States steamer Kearsarge, which played th part of collier.

The plan is for the cruiser to tow the collier with a short a hawser as practicable, the length depending on the state of the sea. The smoother the sea the shorter the tow line. In order that there shall be as little jump to the ships as possible, the cruiser steams ahead very slowly, barely having steerage way.



COALING VESSELS AT SEA.

A jackstay is rigged between the two ships, the higher end being on the collier and the coal in bags, suspended from trolley wheels which hang on the jackstay, runs by force of gravity from the collier to the cruiser. The jackstay consists of a steel wire rope about three-quarters of one inch in diameter. It must be kept properly taut and yet must get no undue strain either from towing or from the plunging of the ships. This is accomplished by using a counterpoise.

The experiment was tried on the 18th of October, off Sandy Hook.

The ships were rigged as follows: On the after part of the cruiser was erected a small derrick or shears about ten feet high, composed of two short spars lashed together at the heads and firmly secured at the heels, on the deck. A cross piece was lashed near the top of the shears and from this cross piece was hung a number of fakes of rope cable to act as a buffer for the bags of coal. Over the cross piece ran the jackstay, one forward end being firmly fastened to the deck near the mizzen mast.

On the forward part of the collier were erected two upright poles to act as guides for the counterpoise. The upper ends of these poles were lashed to the foretopsail yard, the heels being firmly secured to a shoe on the forecastle deck.

The poles were parallel and about four and a half feet apart. A cross piece was lashed near the heads, and from a bridle from this cross piece was suspended a large iron sheave or gin block. Between the poles was arranged a cubical box with guide irons surrounding the poles. The box was also fitted with an automatic lever, spring and eccentric clutches to prevent the box dropping to the deck in case of accidental parting of the jackstay. The contrivance was similar to that used on elevators in buildings. The box weighted with sand formed the counterpoise.

The steel wire rope jackstay was made fast to the counterpoise box, then passed up and over the gin block at the head of the poles, and thence to the