

# SCIENTIFIC AMERICAN

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

Vol. LXVII.—No. 1.  
ESTABLISHED 1845.

NEW YORK, JULY 2, 1892.

\$3.00 A YEAR.  
WEEKLY.

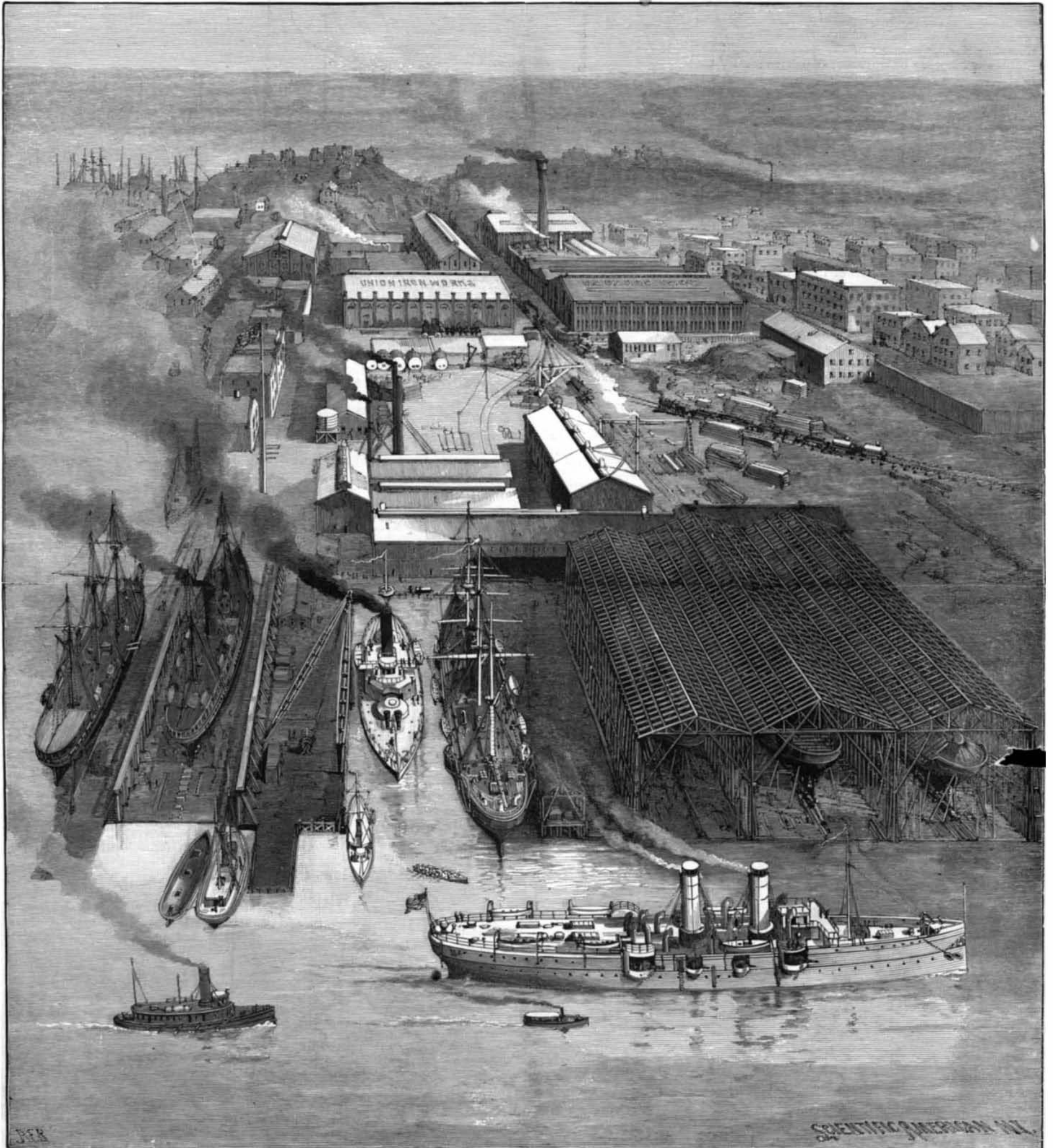
## A GREAT PACIFIC COAST SHIPBUILDING PLANT.

The extensive iron and steel working establishment shown below, with its great facilities for the building of high-powered modern war ships, covers an area of twenty-three acres in South San Francisco and on San Francisco Bay, which is here about seven miles wide. The bay is about forty miles long and twelve miles wide in its widest portion, and is connected with the Pacific by a strait five miles long and one mile wide,

which has gained the famous appellation of the Golden Gate, forming, as it does, a magnificent and easily defensible entrance to one of the noblest harbors in the world. The city of San Francisco lies partly on the strait and partly on the bay, and the latter is connected by a strait on the north with San Pablo Bay, at the head of which, about twenty miles distant from the city, is Mare Island, where there is a United States navy yard, with buildings, machinery, and improve-

ments representing two-thirds the value of the Brooklyn yard.

The Union Iron Works had its small beginning in the first foundry, scarcely more than a blacksmith shop, started in San Francisco by Peter Donahue, in 1849. In 1865 the firm name was changed to Prescott, Scott & Co., and in 1885 the business was removed from the city proper to the larger site at present occupied in South San Francisco, the style being changed to the



SHOPS AND SHIP YARD OF THE UNION IRON WORKS, SAN FRANCISCO, CAL.

Union Iron Works, with G. W. Prescott, president; Henry T. Scott, vice-president and treasurer; and Irving M. Scott, general manager.

The full equipment of the works for the special purpose of building iron and steel ships, and armored war vessels of the greatest power, has been so recent that it is believed the plant in these respects is fully equal to that of any other establishment in the United States, and will compare favorably with any other in the world.

The building of mining machinery was for a long time the principal business of the establishment, and in this specialty the Union Iron Works continues to hold a leading position.

But it is rather on account of the contracts undertaken by the Union Iron Works in the building up of our new navy that the establishment now occupies a position of so much general interest.

The Tinkering Crank.

There is a great deal of truth in what the Manufacturers' Gazette says about some men who never seem to be happy and contented unless they are tinkering.

Brooklyn Institute of Arts and Sciences.

According to the report of the Brooklyn Institute of Arts and Sciences, the present membership numbers 3,859, showing an increase of 1,039 over the membership of 1891.

The membership is divided up as follows among the different departments:

Archeology, 115; architecture, 255; astronomy, 113; botany, 154; chemistry, 135; electricity, 215; engineering, 126; entomology, 50; fine arts, 361; geography, 137; geology, 140; mathematics, 47; microscopy, 133; mineralogy, 117; music, 114; painting, 80; philology, 442; pedagogy, 206; photography, 170; physics, 154; political science, 404; psychology, 144; zoology, 67.

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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.

The Scientific American Supplement is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly. Every number contains 16 octavo pages, uniform in size with SCIENTIFIC AMERICAN.

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NEW YORK, SATURDAY, JULY 2, 1892.

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A NEW SCHOLARSHIP AT SIBLEY COLLEGE.

The Frederick William Padgham Free Scholarship in Mechanical Engineering has recently been established in Sibley College by Mr. Amos Padgham, of Syracuse, N. Y., in memory of his son, lately deceased.

The provisions of the deed of gift are that it shall be open to competition, first, to scholars from the public schools of Syracuse; next, none such appearing, to any competitors from the State of New York.

This adds one more to the already long list of scholarships at Cornell. The State provides one at each annual examination in each assembly district. Five hundred and more young men and women are enjoying these opportunities, for which the State pays simply the interest on about a half million dollars which it holds as the proceeds of the sales of the land grant of the Morrill Act of 1862.

NITRIC ACID BACTERIA.

The development of bacterial study during the last few years has been very striking. The methods of attack supplied by the gelatine culture, divided plate and microscope brought the subject within the scope of ordinary laboratory manipulation, and took it to a certain extent out of the region of the recondite, which is so unfavorable to rapid study and early acquirement of results.

The production of ammonia or of nitric acid from the nitrogen of the air has long been a dream with inventors. Hitherto neither combination has been practically effected, and they have seemed almost impossibilities.

This problem of the fixation of atmospheric nitrogen by plants has been a much-debated subject for many years. Here the bacteria have appeared in the beneficent role of nourishing and supporting plant life. It has been found that plants undoubtedly do absorb the nitrogen of the air, so that it enters into the combinations of their tissues, and this power is dependent on the presence of certain bacteria about their roots.

Again, for different plants it has been found that different organisms are essential, or at least that for each plant there is an especially beneficial form of microbe that supplies it more thoroughly with nitrogen than any other.