

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

Remit by postal or express money order, or by bank draft or check.

MUNN & CO., 361 Broadway, corner of Franklin Street, New York.

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.

Terms of subscription for SUPPLEMENT, \$3.00 a year, for the U. S., Canada or Mexico, \$6.00 a year to foreign countries belonging to the Postal Union. Single copies, 10 cents.

Combined Rates.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for one year, to one address in U. S., Canada or Mexico, on receipt of seven dollars. To foreign countries within Postal Union, 9/10 dollars and fifty cents a year.

Building Edition.

THE ARCHITECTS AND BUILDERS EDITION OF THE SCIENTIFIC AMERICAN is a large and splendid illustrated periodical, issued monthly, containing floor plans, perspective views, and sheets of constructive details, pertaining to modern architecture.

Single copies 25 cents. By mail, to any part of the United States, Canada or Mexico, \$2.50 a year. To foreign Postal Union countries, \$3.00 a year. Combined rate for BUILDING EDITION with SCIENTIFIC AMERICAN, to one address, \$5.00 a year. To foreign Postal Union countries, \$6.50 a year.

Spanish Edition of the Scientific American.

LA AMERICA CIENTIFICA E INDUSTRIAL (Spanish trade edition of the SCIENTIFIC AMERICAN) is published monthly, uniform in size and typography with the SCIENTIFIC AMERICAN.

Single copies 25 cents. See prospectus.

MUNN & CO., Publishers, 361 Broadway, New York.

The safest way to remit is by postal order, express money order, draft or bank check. Make all remittances payable to order of MUNN & CO.

Readers are specially requested to notify the publishers in case of any failure, delay, or irregularity in receipt of papers.

NEW YORK, SATURDAY, JULY 1, 1893.

Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as 'Am. Ass. Ad. Science', 'Ant communities', 'Aphis, the whitepine', 'Battle ship Victoria, the British', etc.

TABLE OF CONTENTS OF SCIENTIFIC AMERICAN SUPPLEMENT No. 913.

For the Week Ending July 1, 1893.

Price 10 cents. For sale by all newsdealers.

Table listing contents of the supplement, including 'I. ARCHITECTURE', 'II. ARMS OF WAR', 'III. CHEMISTRY', etc.

SINKING OF THE BRITISH WAR SHIP VICTORIA.

On June 23, the British first-class battle ship Victoria, flagship of the Mediterranean Squadron, and carrying Vice-Admiral Sir George Tryon, K.C.B., was maneuvering off Tripoli.

The Victoria had been several times illustrated and described by us, and on page 11 is a picture of the great ship, at one time the pride of the British navy.

The above account is far from complete. Torpedo tubes, rapid-firing machine guns, a fighting mast, a most extensive system of hydraulic machinery, a heavily armored conning tower, and many other features in the ship cannot be more than mentioned within our limits.

The British turret ship Captain went down at sea. To descend from greater to less calamities, numerous instances can be cited of collisions between war ships and the minor vessels of commerce.

THE GREAT FAIR.

One of our weekly New York papers, justly noted for the excellence of its illustrations, prints the following as a caption to an editorial, "A Fair or a Fiasco?"

During the first days of the Fair there were no doubt many just causes for complaint, nearly all of

which are now settled in a satisfactory manner, and even the photographic nuisance has been abated. After the Fair has been in operation over six weeks, or one quarter of the allotted period of exhibition, it really seems time to call a halt.

PROPOSED SUBMARINE WAR BOATS.

The Fifty-second Congress appropriated the sum of \$200,000 to build and experiment with a submarine torpedo boat. Nine bids for a submarine boat have been opened and referred to the Naval Ordnance Bureau for examination.

A surface torpedo boat, owing to the high speed required, must of necessity be built very light, which of course exposes it to the destructive fire of the machine guns, for the torpedo range is very short as compared with that of a naval gun.

Early Steam Navigation.

The Liverpool Journal of Commerce has the following article on early steam navigation:

"With the increase of trade and population there is a progressive demand for steam navigation facilities. Without sufficiency of cargo and passengers to make a venture pay, or no help of a bounty or subsidy when traffic is sparse, financial success is out of the question.

"The Grand Treasurer of Spain did not believe in the safety of vessels propelled by steam, and he retarded the introduction of ships propelled by that agency. On the 17th of June, 1543, the La Santissima Trinidad, of 200 tons, was driven at the rate of one league per hour in the roadstead of Barcelona.

"From several official sources it is made evident that the practical application of the steam engine to marine propulsion was an accomplished fact three centuries and a half ago. Seagoing steamers date from the building of the James Watt by John Wood & Co., in 1818, for the Leith and London trade.