

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, postage included. \$3 00
One copy, six months, postage included. 1 50

Clubs.—One extra copy of THE SCIENTIFIC AMERICAN will be supplied gratis for every club of five subscribers at \$3.00 each; additional copies at same proportionate rate. Postage prepaid.

Remit by postal or express money order. Address

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, \$5.00 a year, postage paid, to subscribers. Single copies, 10 cents. Sold by all newsdealers throughout the country.

Combined Rates.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for one year, postage free, on receipt of seven dollars. Both papers to one address or different addresses as desired.

The safest way to remit is by draft, postal order, express money order, or registered letter.

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

Scientific American Export Edition.

The SCIENTIFIC AMERICAN Export Edition is a large and splendid periodical, issued once a month. Each number contains about one hundred large quarto pages, profusely illustrated, embracing: (1.) Most of the plates and pages of the four preceding weekly issues of the SCIENTIFIC AMERICAN, with its splendid engravings and valuable information; (2.) Commercial, trade, and manufacturing announcements of leading houses.

Terms for Export Edition, \$5.00 a year, sent prepaid to any part of the world. Single copies, 50 cents. Manufacturers and others who desire to secure foreign trade may have large and handsomely displayed announcements published in this edition at a very moderate cost.

The SCIENTIFIC AMERICAN Export Edition has a large guaranteed circulation in all commercial places throughout the world. Address MUNN & CO., 361 Broadway, corner of Franklin Street, New York.

NEW YORK, SATURDAY, JULY 31, 1886.

Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as Baseball, Books and publications, Burning of Moscow, Beach, Business and personal, Cataract, Check row corn planter, Coal, Cork, Coupling, Discharge pipe, Drawer check and support, Driving apparatus, Electrical subways, Electricity, Etna eruption, Fireworks, Gases, Hornbills, Inventions, Lamp filling attachment, Measuring wheel, Meteor, Meteorite, Microscopic objects, Moles, Novelty, Obesity, Oil, Oregon, Panama Canal, Perkins, Photographs, Pitching in baseball, Polar scope, Polariscope, Polarized light, Quilting frame, Ship transit across the Isthmus, Ships, Spring balance, Swindlers, Tadpoles, Tea drinker's diseases, Telegraph circuit, Telephoning, Trades and professions, Trees, Watch case springs, Whale hunting, Wheat, Woolen fabric, Yachts.

TABLE OF CONTENTS OF

SCIENTIFIC AMERICAN SUPPLEMENT

No. 552.

For the Week Ending July 31, 1886.

Price 10 cents. For sale by all newsdealers.

Table listing sections I through IX: I. BIOGRAPHY—Oliver Evans and his Inventions; II. CHEMISTRY—Effect of Chloride of Iron on the Teeth; III. ELECTRICITY—The Transformation of Heat into Electrical Energy; IV. ENGINEERING AND MECHANICS—The New Tower Bridge; V. GEOLOGY—Water and Carbonic Acid from Space; VI. HYGIENE AND MEDICINE—Cardiac Pulmonic Balance; VII. SURVEYING—On a Hyperbolograph; VIII. TECHNOLOGY—Improved Regenerative Gas Furnace; IX. ZOOLOGY—Flamingoes.

NEW YORK ELECTRICAL SUBWAYS.

The Electrical Subway Commission, having decided that the best plan for putting the telegraph, telephone, and electric light wires underground in the city of New York consisted in a conduit of asphalt concrete, has now awarded the contract for its construction to the Consolidated Telegraph and Electrical Subway Company.

In no case are they to exceed the cost of keeping up the wires as at present, or ten per cent upon the capital invested in constructing and maintaining the conduits.

The work of constructing the conduits will be begun, probably, about the middle of August, and will proceed, it is stated, at the rate of 500 feet per day.

It is hardly probable, however, that the work of putting the wires underground will be permitted to proceed without the interference of an unusually large number of injunctions and lawsuits.

SHIP TRANSIT ACROSS THE ISTHMUS.

It is a fact so curious as to be worthy of remark that the canal projects of Panama and Nicaragua have, almost simultaneously, met with an ill-fortune which can scarcely help to weaken the confidence of the public in their practicability.

Whatever may have prompted the committee to withhold its sanction to the new loan after a consideration of three months, it must be apparent even to the dullest intellect that the road to success in this enterprise is not clear, and the methods by which its promoters hope to attain it by no means certain.

As to the project for a lifting lock canal at Nicaragua, which has long found favor among American engineers, the recent earthquake in the vicinity of its route sweeps away in a moment a principal argument put forward in favor of its selection.

It is within the range of probability that De Lesseps may yet discover a means of raising another \$120,000,000 among his countrymen, whose faith in his ability is so abiding that even the grossest errors of calculation, the most evident misstatement of well known facts, and ideas as to financial management that would startle the most reckless stock-jobber, may not be relied upon to shake it.

Even if another \$120,000,000 should be put into the Panama Canal project, there is abundant evidence to prove that it would be insufficient. Eminent engineers, who have carefully examined the work already done and what remains, have estimated that the completion of such a canal at this point will require a gross expenditure of about \$500,000,000.

It is reported that M. De Lesseps recently told his countrymen that should they fail to support the Panama enterprise, it would be turned over to the Americans, who would eagerly put their dollars into it.

Those who are aware of the apathy with which the Panama scheme was received in this country at its inception will be slow to believe that now, when its earlier promises have proved so visionary, capital will be found here ready for investment in Panama Canal shares.

projects. Ever since President Cleveland spoke in favor of the ship railway, in his message to Congress, the current of opinion has turned in that direction, and now that the route of the proposed Nicaragua Canal has proved to lie within the earthquake belt, Eads' project is thought to be the only practicable one.

BASEBALL.

Probably there has never been an out of door amusement which has taken the whole country so by storm as baseball playing has done this season.

The skill exhibited by the experienced players has attracted crowds of people from long distances to witness match games, and the enthusiasm manifested on the field shows that it is not a mock interest or fashion that has brought them together, but that it is the skill of the players that attracts such fabulous numbers.

The knack of a skillful "pitcher," who sends his ball so that it diverges from a straight line after leaving his hand, and curves in any direction at the will of the pitcher, so as to deceive the "batter," is an attainment which but a comparatively few have reached, but it is a science which every amateur player would like to acquire.

In another column Mr. Chadwick, who probably understands the game of baseball as well as any writer on the subject, explains his theory of the curved ball, which so many have watched with interest and so few have attempted to explain.

A New Ocean Telegraph Circuit.

At present, when telegraphic messages are sent from the United States to Brazil, they must first be cabled to Europe, and then sent from there to their destination. This is not only a very roundabout method, but also very expensive, each word costing \$2.06 for its transmission.

The Wreck of the Oregon.

Six divers are now constantly at work on the Oregon, steam pumps being used to supply them with air. Each man remains under water from a half hour to an hour at a time. By the end of that period, the pressure becomes difficult to bear.