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.

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 andpages of the four preceding weekly issues of the Foierfield American, with its splendid engravings and valuable information; (2.) Compercial, 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. Export 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., 381 Broadway, corner of Franklin Street, New York.

NEW YORK, SATURDAY, JULY 31, 1886.

Contents.

(Illustrated articles are marked with an asterisk.)

(111 111 111 111 111 111 111 111 111 11	·
Check row corn planter*. Ceal, bituminous, our, wonderful things produced from Cork. Coupling, clip, for vehicles*. Drawer check and support*. Driving apparatus, Lowther's*. Electrical subways, New York Electricity, positive and negative. Etna, erruption of	of, instrument fur* Notes and queries Novelty, a, wanted Novelty, a, wanted Obesity, treatment of, Galen on Oil fuel not economical Orgon, the wreck of Panama Canal Perkins, George L Photographic notes Polariscope for microscopic ob- Jects* Olifting in baseball, art of* Polariscope for microscopic ob- Jects* Oulling frame. Wright's* Oulling frame. Wright's* Ship transit across the Isthmus Off Spring balance gravity. Swindlers, petty, ingenious. Tadpoles, polarity of. Telephoning, long distance. Tricker and their tricks. Trades and professions in France 7 Treads and professions in France 7 Trades and professions in France 7 Watch case spring* Watch case spring* Wheat, exports of. Wheat exports of.

TABLE OF CONTENTS OF

SCIENTIFIC AMERICAN SUPPLEMENT

No. 552,

For the Week Ending July 31, 1886.

Price 10 cents. For sale by all newsdealers.

- I. BIOGRAPHY.—Oliver Evans and his Inventions.—By COLEMAN SELLERS, Jr.—His life as a store keeper, miller, author, and inventor.—The great improvements he introduced in flour grinding machinery.—His steam engine and dredging machine.—His proposition of steam locomotion.
- II. CHEMISTRY.—Effect of Chloride of Iron on the Teeth: An Experimental Study.—By GEORGE W. WELD, M.D.—The injurious effect of the tincture upon the teeth and the modifying action which the strength of the solution exercises.—The effect of alcohol in preventing injury.

SOHNCKE Voltaic Cell with a Solid Electrolyte.—Proposed by SHELFORD 8816

- An Electric Fuse.—A safe method of securing the ignition of mines.—I illustration..... mines.—Illustration.

 The Propulsion of Electric Pendula.—By P. H. VANDER WEYDE, M. D.—The use of electricity for driving clocks and the different devices which have been suggested.

 Secondary Electrolysis.—By Prof. E. Semmor.a.—The phenomena observed on introducing an isolated conductor in an electrolytic fluid with its ends approached to the anode and cathode.—1 8816 8816
- GEOLOGY.—Water and Carbonic Acid from Space.—An interesting discussion of the conditions of the atmosphere during the coal pe-A Waterspout in the Roadstead of Toulon.—Anaccount of the waterspout of May 4.—1 illustration.
- VI. HYGIENE AND MEDICINE.—Cardiac Pulmonic Balance; a Clinical Study.—By B. W. RICHARDSON, M.D.—Disturbed balance from morbid changes and atmospheric variations.—Effects of mental and physical shocks, and of volatile fluids.—Vital considerations.—Points of practice
- VII. SURVEYING.—On a Hyperbolagraph.—By H. H. CUNNYNG-
- VIII. TECHNOLOGY.—Improved Regenerative Gas Furnace.—The furnace at the West Middlesex Rolling Mills constructed by W. A. Waplington.—Illustration.
 Waterproof Papers.—Parchment.—Toughened and dissolved papers.—Paper lumber and manufactured articles.—The patents of Tayler, Hanna, and Parks.—Second instalment.

 Delmas' Hot Air Burner.—I illustration.
- IX. ZOOLOGY.—Flamingoes.—An account of the appearance home, and habits of the bird.—I illustration......

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 shall be the servant of the Commission, and subject mission.

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 contract has been provisionally signed, and a bond of half a million dollars executed by the company as a guarantee of the faithful performance of

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. The contracting company claims to own patent rights covering the manufacture of asphaltum-concrete conduits, as recommended by the Commission, to the number of twenty-one, and to control several others in addition.

It is hardly probable, however, that the work of putting the wires underground will be permitted to proceed without the interference of an unsually large number of injunctions and lawsuits. It is still an open question, in the first place, as to whether the Commission has the authority to make such a contract.

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. At Panama, the \$120,000,000 that was to have been sufficient to pay for the construction of a tide-level canal having been expended, it was thought advisable by the promoters of the scheme to ask the French Chambers to inquire into the matter; to assure, at least, the French public that a canal at that point was feasible, and to sanction the raising by lottery or subscription of a like sum, which M. De Lesseps avers is necessary in order to surmount those unforeseen difficulties which usually present themselves in works of such magnitude. Such dilatoriness has been shown by the committee of the Chambers selected to make this examination—a dilatoriness which some allege comes from lack of proof thus far presented to it of the practicability of the project—that De Lesseps has asked M. Freycinet to take the matter out of its hands.

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. Nicaragua, we have been told, is outside the zone of earthquakes, and hence that the great works necessary to such an elaboration of waterways would remain undisturbed from those violent upheavals which periodically visit the greater portion of the Central American main.

It is within the range of probability that De Lesseps may yet discover a means of raising another \$120,000,000 abiding that even the grossest errors of calculation, the air. Each man remains under water from a half most evident misstatement of well known facts, and hour to an hour at a time. By the end of that period, ideas as to financial management that would startle the the pressure becomes difficult to bear. The air is most reckless stock-jobber, may not be relied upon to forced through five-ply rubber hose, which it would shake it.

diture of about \$500,000,000.

It is reported that M. De Lesseps recently told his ama enterprise, it would be turned over to the Americans, who would eagerly put their dollars into it.

8821 Nicaragua Ship Canal have long been the favorite mast and mizzenmast are still visible above the water.

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 New York consisted in a conduit of asphalt concrete, has proved to lie within the earthquake belt. Eads' has now awarded the contract for its construction to project is thought to be the only practicable one. The the Consolidated Telegraph and Electrical Subway strongest point in its favor, and one which cannot fail Company. The contract provides that the company to commend it in the eyes of practical men, is that its cost can be estimated with something like certainty; always to its authority; that the conduits are to be for railway construction has reached that point where built by the company in accordance with the plans of material, cutting and filling, and labor can be comthe Commission, and maintained under such rules and puted in advance; and as to lifting ships out of the regulations as it may adopt. It is stipulated also that water, and their ability to bear the strain of transporno favoritism is to be shown to any one, and that the tation, no other means are required than those already conduits are to be open to all companies at the same in successful use in the dry dock and the marine railproportional rentals, which are to be fixed by the Com- way. Best of all, the promoters of the ship railway ask not a dollar from the Government until they have shown in actual practice the capability of their construction to transport ships from ocean to ocean.

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. If any one can advance any better theory as to the way the ball is held or thrust from the hand, the editor will be glad to hear from him.

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. A new enterprise has just been organized in New York for the construction of a direct cable from this port to Venezuela and Brazil. It is called, in honor of the Emperor, the Pedro Segundo American Telegraph and Cable Company, and starts out with a capital of \$2,500,000. The imperial government of Brazil and republic of Venezuela have both granted very favorable concessions to the new company. Its cable will be over four thousand miles long, and is being constructed in England. It will probably be completed in a few weeks, and will be laid as soon as the equinoctial storms are over. It can be put in place in three months, and it is thought will be ready for business before the end of the year. The cable will begin at Viseu, on the coast of Brazil. It will touch at Cayenne, French Guiana, and will connect with the land lines of Venezuela at the mouth of the Orinoco River. The cable will then follow the coast, connecting with Caracas and other important points. From Venezuela it will be carried to Port au Prince, Hayti, now without cable connection, and thence directly to New York.

The Wreck of the Oregon.

Six divers are now constantly at work on the Oreamong his countrymen, whose faith in his ability is so gon, steam pumps being used to supply them with be almost impossible to cut or break. The greater Even if another \$120,000,000 should be put into the part of the cargo has now been removed. It consists Panama Canal project, there is abundant evidence to largely of cotton goods. The divers, armed with hooks prove that it would be insufficient. Eminent engineers, like the llongshoremen, take hold of the bales, and who have carefully examined the work already done transfer them to the steam pulleys by which they and what remains, have estimated that the completion are hoisted on board the wrecking vessel. The averof such a canal at this point will require a gross expen- age daily work accomplished is twenty bales. It is probable that the whole cargo will be removed within a few weeks. Most of the mail has also been recovcountrymen that should they fail to support the Pan-ered. We are still receiving magazines and other mail matter from the ill-fated vessel, but their long immersion in the sea has detracted considerably from Those who are aware of the anathy with which the their value. In order to get at the mail room, it was Panama scheme was received in this country at its in- necessary to blow a hole in the side of the vessel ception will be slow to believe that now, when its with dynamite. Much of the mail, however, was utearlier promises have proved so visionary, capital will terly ruined before its recovery. The Oregon itself is be found here ready for investment in Panama Canal rapidly going to pieces. Not only has she broken in shares. The fact is that in this country the Eads Ship two between the mainmast and the foremast, but her Railway across the Isthmus of Tehuantepec and the bow has already fallen over in the sand. The main-