

Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT

NO. 37 PARK ROW, NEW YORK.

O. D. MUNN.

A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

One copy, one year, postage included. \$3 20

One copy, six months, postage included. 1 60

Clubs.—One extra copy of THE SCIENTIFIC AMERICAN will be supplied gratis for every club of five subscribers at \$3.20 each; additional copies at same proportionate rate. Postage prepaid.

Single copies of any desired number of the SUPPLEMENT sent to one address on receipt of 10 cents.

Remit by postal order. Address MUNN & CO., 37 Park Row, 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, with handsome cover, uniform in size with SCIENTIFIC AMERICAN. Terms of subscription for SUPPLEMENT, \$5 00 a year, postage paid, to subscribers. Single copies 19 cents. Sold by all news dealers throughout the country.

Combined with 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, or registered letter. Address MUNN & CO., 37 Park Row, N. Y.

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 pages, profusely illustrated, embracing: (1.) Most of the best articles 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., 37 Park Row, New York.

VOL. XL., No. 25. [NEW SERIES.] Thirty-fifth Year.

NEW YORK, SATURDAY, JUNE 21, 1879.

Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as Amalgamator Co., Forster-Frind, Bees, utility of, Belts, slipping, preventive for, Brick making on the Hudson, Canal, the Isthmus, Cement for rubber and wood, Color blindness, Chinoeremata, interesting, Electric light, divisibility of, Emigration to the United States, Engineering, locomotive, Engine, steam, small, Etching, steel, Etna in eruption, Exhibition, permanent, Boston, Expedition to Shassaa, Experience, a prairie boy's, Fatally polluted steam, Filters, water, Finishing press, improved, Fire, put out by sunlight, Flower stand, Force and fly wheels, centrifugal Governor's Island, world's fair, Gun barrel, to brown, Habits of wild animals at night, Hardware, American, Hiccough, cure for, Hoe, scuffle, Hydrants, improved, Induction coil, wires of, Ink, blue, to make, Inventions, engineering, Inventions, mechanical, recent, Iron, white to toughen, Land, to keep wet, Lawton, Paper B, Letters, copying, Lightning conductors, Lightning rods, arrangement of, Linsed oil, medical uses of, Meteor, spiral, Metric system, the, Mexican exhibition.

TABLE OF CONTENTS OF

THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 181,

For the Week ending June 21, 1879.

Price 10 cents. For sale by all newsdealers.

Table listing contents of the supplement such as I. ENGINEERING AND MECHANICS.—The Berthon Folding Canoe. Large illustration with plan and sections. On the Form of the Stern and the Arrangement of the Propellers in Screw Ships in Order to Obtain the Best Effect in Propulsion. By ROBERT GRIFFITHS, C. E. A very important paper read before the United Service Institution, April 21. Useful Notes for Masters and Officers of Screw Steamers. Spiral Slide Rule. A portable calculating instrument invented by Professor George Fuller. 1 illustration. The Grinding Lathe. Designed for the Austrian State Railways. 3 engravings. II. MINING AND METALLURGY.—Iron and Steel. Inaugural address of President Edward Williams, of the British Iron and Steel Institute. Initial processes. The Bessemer discovery. Puddling. Improved working. Steel and its uses. Remelting. The new steel making process. Steel making equipment. The future of iron and steel making. Furnaces. Foreign and American competition. Wasteful ingot making. Rolling machinery. Scientific training needed. Unqualified managers. Future prospects. The Removal of Phosphorus and Sulphur During the Bessemer and Siemens-Martin Processes of Manufacture. Paper read by GEO. J. S. SMILES before the Iron and Steel Institute, with discussion. Miners' Lingo. Definition of the terms used by miners. III. TECHNOLOGY.—Ornamenting Textile Fabrics. By WILLIAM W. CARPENTER. On Silk Dyeing. By MARIUS MOYRET. Direct dyeing. Indirect dyeing. Alumina mordants. Wax of Fleus Gummiifera. By F. KESSEL. Rational Utilization of the Water for Fulling Mills. By A GAWOLSKY.—Compressed Flour. IV. RECENT SCIENCE.—Continuation of Paper in SUPPLEMENT No. 17. New products from beets. Chemistry of yeast. Chlorophyll-containing animals. Nuclei of cells. Maturation and impregnation of the animal ovum. V. PHYSICS AND CHEMISTRY.—Professor Crooke's Remarkable Discoveries Concerning Molecules. Latest experiments with electrified molecules in vacuo. The trajectory of molecules. Heat and light from molecular impact. 9 figures. Proceedings of the Physical Society, London, April 25. Arago's rotation, sound, electricity, magnetism, etc. American Gas Liquor for Extinguishing Fires in Tar Distilleries. By WATSON SMITH. Chemical Products of Soft Coal. Reductive Action of Milk Sugar upon Alkaline Solution of Copper. By H. RODEWALD and B. TOLLENS. VI. MEDICINE.—Nature of the Poison of Yellow Fever and its Prevention. By DR. H. D. SCHMIDT, New Orleans. VII. ELECTRICITY.—The Electric Light in Large Cities. Testimony of MR. WILLIAM HENRY PREECE, before a British Parliamentary Committee. Edison's Electric Candles. Latest Patent. Thermic and Galvanometric Laws of the Electric Spark Produced in Gases. By E. VILLARD. VIII. ASTRONOMY.—The Curious Astronomical Phenomenon Observed by Mr. Henry Harrison last April. Illustration. The Life and Discoveries of Leverrier. 1 illustration. IX. ART AND ARCHITECTURE.—New Church of the Oratory, South Kensington. Prize Design by MR. HERBERT GRIBBLE, Bayswater, Eng. 3 illustrations. Interior, plan, elevation. Modeling in Clay. By EDWARD A. SPRING. La Tufoina. The New Statue by O. TABACCHI, Naples. X. NATURAL HISTORY.—The Quince and its Propagation. The tree creeper; cecilia familiaris; wings and arms (verses.)

A PRAIRIE BOY'S EXPERIENCE.

The habit of intelligent industry is, all things considered, not only the best legacy a father can leave his sons, but one of the most enduringly valuable elements of any boy's education. Emphasis, however, is to be laid on the word "intelligent." Habitual hard work, with no other motive than compulsion, is sheer slavery; and many a parent has found his efforts to make his sons industrious thwarted and their lives spoiled, simply because he has unwisely undertaken to give them the training of slaves, not that of free spirited and interested toilers. It is not the amount of work that boys do, but the manner of their doing it that makes them like or dislike hard work.

Absolute idleness in youth is often a better preparation for successful effort in riper years, on the farm or in the workshop, than a youth of unwilling drudgery. And one cause of the eagerness of country boys to abandon farm life has been—and this the chief cause—the unwisdom of parents in making their boys feel to the full the monotony and drudgery of farm life while restricting in every way its enjoyments. When boys are given a liberal foretaste of the freedom, the wholesome joys, and the profits of country living, they will be less likely to feel that anything is better than farming. And the same laws hold in every other industrial calling.

We are led to dwell upon this aspect of parental management by a Kansas letter to the New York Tribune, in which the writer tells the story of a prairie boy's experience at the hands of a wise father. The setting of the story we have no space for. Suffice it to say that it came out of a casual encounter between a country boy and the writer, who had lost his way. While conducting the traveler to the road he had strayed from the young pioneer contrasted his father's plan of encouraging his boys in being industrious and that of a neighbor.

"Now, there is Mr. A., who lives on the quarter section adjoining ours, and he has two sons, John and Henry. John is a little older than I, and Henry a year younger. Well, the way he encourages his boys is by having them up by daylight in the morning and keeping them on a keen jump all day long. He hardly allows them time to eat their meals. Why, last summer they worked till 9 o'clock every evening, and didn't find an hour all summer in which they could go a fishing, or even in swimming. Then to pay them the old man gives them their board and his own worn out clothes, with occasionally a pair of boots or something of the kind thrown in. That is the way he teaches them to be industrious. But father's plan is entirely different. He gave me four acres of land which he had broken (this was two years ago last spring), and I was to do just what I pleased with it, and he would furnish me seed or means to obtain seed; all that he required of me was that I should attend to the garden, do the chores at the barn, and go to school in the winter.

"The first year I planted corn, and from my four acres I raised 120 bushels, which I sold for 30 cents a bushel.

"The next spring father let me have the use of his team, and I plowed my four acres and planted one and a half acres in castor beans, one half acre I put out in strawberry plants, one acre in sorghum, two rods in onions, and the remainder of the acre in sunflowers. Father laughed when I told him my plans, but he said it was my own land and I could do as I liked with it. I told him I wanted to experiment on different crops, so as to see which was the most profitable. Well, my castor beans were a good deal of trouble. I had to watch them so closely not to lose them when they cracked open. It was necessary to pick them immediately as fast as they ripened; but my little sister, seven years old, could attend to them about as well as I, and she did this faithfully on my promising her \$5 when I sold my crops in the fall. I raised twenty-two bushels of beans off of my one and a half acres, which I sold at \$1.25 a bushel, so after paying my sister \$5, I realized for them \$22.50. Father had raised considerable sorghum, and he had all of the arrangements for pressing, boiling, etc. We worked together in preparing our sorghum, and I had from my one acre two barrels of good sorghum molasses, which I sold for 35 cents a gallon, thus making \$22 from my sorghum crop. My sunflowers, which were the laughing-stock of so many, brought me enough to pay me for my trouble. I had planted and cultivated them very much as if they were corn. The flowers were splendid, many of them measuring three feet six inches in circumference, the stalks being from ten to twelve feet long and three inches in diameter. I planted them principally for the stalks, which I sold over at the next town for fuel. I had ten cords off of that part of an acre, and I realized \$15 from the sale of them. I gave the seeds to father for his poultry. He thinks they are better than corn. Those who bought the stalks say that they burn readily, and make a very hot fire.

"Last spring I planted nothing but sorghum and onions, as they had brought me the most the year previous, and I have done better than either year before. My onions were the most profitable crop of all, as I made \$12 off of my two rods. So last fall I had, after disposing of my crops, \$71.50 in cash, nearly double what I had made the year before. I spent \$20 of this on my wardrobe, \$10 at Christmas, bought three more calves at \$10 a head, and had \$11.50 left for sundries. My onions didn't do quite as well as the year before. So this year I have made \$300 off of my four acres. I can assure you I am beginning to feel very much encouraged in being industrious. I have just bought twenty more calves. I had to pay \$12 a head for these, but they are beauties, I can tell you. If they do well they ought certainly to be worth in a

year from now \$450. I was offered \$90 to-day for my other lot. I have no trouble in finding a market for my produce; for what I cannot sell here I ship on the railroad, and, as they carry at reasonable rates, I often prefer shipping, as I get better prices in the larger towns. I shipped nearly all of my strawberries this year.

"I was fifteen years old last August, and am worth to-day \$390. To be sure my father has favored me in every way, furnishing me with seed, feed for my stock, allowing me the use of his team and farming implements, etc. But now I can afford to be more independent, and hope before long to help him, instead of his helping me. Father is making money, too. This is a fine wheat country, and he has put the most of his land into wheat. We have had fine seasons so far for our crops, and next year we may have grasshoppers or drought, or some drawback; but we have enough ahead now to stand one or two unprofitable seasons, so we don't worry. I intend to invest every year in stock, as I have found it far more profitable than anything else."

The moral of the story goes without telling.

UNKNOWN NEW YORK.

That the State survey of the Adirondack wilderness should have discovered mountains, lakes, and other geographical features as little known to the world as the mountains and lakes of Central Africa, was not surprising. It does strike one as strange, however, that the geography of the central counties of the State should be little if any better understood. Yet the State surveyors found last year that every one of the cities and towns of that region, to the number of two hundred or more, were from one to two miles out of place, on every map of the State hitherto published. And worse than that, the topographical features of that thickly settled and prosperous part of the State are sadly misrepresented on all our maps. In reviewing the work of the survey during the past year, Director Gardner remarks that "few people realize that in the central part of our State, represented on their maps as level regions, are mountains rising to such heights above the surrounding country that the eye can sweep at a glance 5,000 square miles of land and lakes, touching here and there blue horizons over sixty miles away." The deep pleasure which these broad but unvisited views inspired very naturally increased Mr. Gardner's regret that the topography should be so unknown to educated people. "In Germany," he says, "every child is taught the physical features of its native country; but in New York, neither young nor old know the aspects of those counties which they have not personally visited. In this matter, like the Indians, they know only what they have seen." This criticism he makes on the strength of a wide intercourse with the intelligent citizens of central New York, to whom he has often put questions to test their knowledge of the topography of their part of the State.

"I am led to recur to this subject," he concludes, "because of the deep impression made upon me each season by the unexpected grandeur, beauty, and variety of the landscapes seen in the prosecution of our work. Ideas of the aspects of the State derived from maps have, in my own case, proved to be so false and vague, that I find in this survey the attractive novelty of exploring an unknown region. Colorado was not a greater surprise to me than has been the structure of my native State. In the study of the origin of some of its most remarkable features lie untrodden tracts of knowledge which are yet to awaken great interest. The configuration of a part of central New York is as unique and as unknown to science as that of any part of the Rocky Mountains."

STRIKE OF PITTSBURG PUDDLERS.

By the strike of the puddlers of Pittsburg, Pa., June 2, something like 40,000 men were thrown out of employment in that city and in Allegheny, with the prospect of stopping the work of all the men employed in the coal mines and other establishments connected with the mills. A few mills which were practically independent of puddlers, remained at work, but with small prospect of continuing long. The Herald report of that date says:

"This morning, about ten o'clock, 200 puddlers formed into a line and marched up Liberty street and Pennsylvania avenue to the steel works of Hussey, Howe & Co. They threatened the employes of this firm with unpleasant results if they did not stop work. The firm has only sixteen puddlers, although it employs 500 hands. The men would not stop work in the middle of the day, but said they would to night. The strikers then separated and went to various mills where they thought there were any 'black sheep,' or men who were disposed to work at less than regular rates, and they ordered all such men not to go to work. This is the first strike in which the iron workers have stopped the steel workers."

As usual this is not a strike of labor against capital, but rather the action of a few unscrupulous workmen who are willing to take advantage of their position to stop the wages of ten times their number of fellow workmen.

THE UTILITY OF BEES.

One of our foreign exchanges states that a great bee master, the Rev. M. Sauppe, in Lückendorf, has made the following calculation, intended to prove the eminent agricultural and economical importance of the rearing of bees: Of each of the 17,000 hives to be met with in Saxony 10,600 bees fly out per diem—equal to 170 millions—each bee four times, equal to 680 millions, or, in 100 days, equal to

680,000 millions. Each bee, before flying homeward, visits 50 flowers, therefore the whole assemblage has visited 3,400,000 millions of flowers. If out of the ten only one flower has become fertilized, 340,000 millions of fertilized would be the result.

Supposing the reward for the fertilization of 5,000 flowers to be one German pfennig, the united bees of Saxony have obtained per annum a sum of 68 million pfennigs = 680,000 marks (\$170,000). Each hive represents in this way a value of ten dollars.

PHILANDER HIGLEY ROOTS.

Another of the pioneers in American invention and mechanical industry, Mr. P. H. Roots, of Connersville, Ind. has come to the end of a long and useful life. Mr. Roots was born in Rutland, Vermont, Nov. 17, 1813. In his fifth year his parents removed to Oxford, Ohio. His mechanical genius developed early. While still in college he experimented with rotary engines, achieving notable results for the facilities for construction at his command. About the same time he developed a plan for raising water by means of the condensation of steam, the apparatus, though imperfectly made, proving quite a success.

After completing his college course, at Miami University, Mr. Roots went into business of woolen manufacturing, with his father and two elder brothers. The crude and imperfect machinery in use at that time was very unsatisfactory to him, and much of his time was spent in constructing appliances of various kinds to save labor and do more perfectly the work that at that time was done almost entirely by hand. Many of these devices were entirely successful, and were in constant use until the woolen mill of which he was part owner was burned in 1875. Probably all of them were patentable. He early made a model for a power loom, having a positive motion for throwing the shuttle derived from the motion of the lathe itself. Several years after he invented a cam motion of a peculiar kind for working the harness of power looms. The arrangement was such that it could be easily changed to weave any regular fabric, with any number of leaves, each of which had a positive motion, and was entirely independent of the others. The plan was afterwards patented by other parties, and is in successful use in nearly all the mills in the country. He also invented a Jacquard arrangement for fancy cassimere looms, which was successfully used for many years, and probably was inferior only to the Crompton loom in point of workmanship.

He also constructed a warping mill for woolen goods, in many respects superior in its general adaptation to all kinds of work, warping, sizing, and drying perfectly in one operation. Many other devices might be mentioned, for they were, his brother says, all through the mill, and no machine was accepted as being perfect, even from the best manufacturers, unless it could do all he thought it ought to do in the best manner.

Between 1856 and 1860, in connection with his brother F. M. Roots, he developed and perfected the rotary blower, so widely known throughout the mechanical world. Mr. Roots, however, was not an inventor only. His knowledge of every department of the woolen manufacture, in which he was so long engaged, was uncommonly extensive. He was also a great reader, and was widely respected for varied and extensive information. In his family and social relations Mr. Roots was greatly beloved and respected. He died Sunday, May 18, 1879.

Steam on Third Avenue.

A trial of the Angamar steam motor was made on the Third Avenue surface road, June 2. During the day several trips were made from Sixty-fifth street to Printing-house Square, in connection with one of the large open cars. The conductor said the motor could have drawn two or three cars if necessary. As it passed up and down during the busy hours of the day it attracted a great deal of attention, and caused no little fright to some spirited horses. On several occasions ladies wishing to take a car of the Third Avenue line declined, with a dubious shake of the head, the conductor's invitation to get on board. Others however, showed no hesitation. The engineer managed the starting and stopping on signals from the conductors of the motor and the attached car with apparent ease and promptness. The motor resembles an ordinary street car in shape, but it is higher and larger. The driving machinery is under the floor. On the front platform are the small furnace and boiler. Here also the engineer sits with his hand on the lever. Hot water is pumped into the boiler at the depot, and little fire is needed to keep it at the steam generating point.

The president of the railroad company said that the company had determined to adopt some substitute for horses as soon as a satisfactory one could be found.

Centrifugal Force and Fly Wheels.

It is not always that practical men are willing to admit the value and importance of scientific knowledge as regulating the operations and accidents of a workshop. We had a valuable incident of the kind that forced itself upon our notice, says a foreign contemporary, a few days back. A large pulley or rigger, 3 feet in diameter, and very wide, was split across its rim by carelessness in unloading; at the same time it was noticed that two of the arms out of six were cracked by contraction in cooling. In order, however, to save expense it was proposed to patch the broken rim of the pulley

with wrought iron plates, which was done. "Per se" the iron plates were stronger than the original casting, but the whole weight of the patch amounted to about 15 lbs. As the pulley revolved at the rate of six hundred revolutions a minute, this unbalanced weight on the rim became by calculation as much as 7½ cwt. radial force outwards. This scientific result was brought to the knowledge of the practical men, but they could not see why the pulley would not do very well if the patch was as strong as the rest of the rim. The pulley was accordingly run under protest, and hardly had the maximum speed been attained before the pulley flew in pieces, and might have been dangerous to life and limb. The pulley, undoubtedly, broke, as above indicated, by centrifugal force, which, by the unbalanced patch of 15 lbs., caused a breaking radial pressure outward upon the broken rim at the position of the patch of 7½ cwt. This was quite sufficient to break the rim outward with enormous force, so that the pieces flew about the shop like fragments of a bursting shell. It will be well for machinists to remember this incident when they have occasion to repair fly-wheels.

Natural Enemies of the Electric Telegraph.

There is, apparently, no apparatus so liable to be interfered with by what we may call natural causes as the electric telegraph. Last week we saw what perils from vermin and fungus environ the subterranean wires. Fish gnaw and mollusks overweight and break the submarine conductors; while there is at least one instance of a frolicsome whale entangling himself in a deep sea cable, to its utter disorganization. It is stated that within the three years ending 1878, there have been sixty serious interruptions to telegraphic communication, in Sumatra, by elephants. In one instance, these sagacious animals, most likely fearing snares, destroyed a considerable portion of the line, hiding away the wires and insulators in a cane brake. Monkeys of all tribes and sizes, too, in that favored island, use the poles and wires as gymnasia, occasionally breaking them and carrying off the insulators; while the numerous tigers, bears, and buffaloes on the track render the watching and repair of the line a duty of great danger. In Australia, where there are no wild animals to injure the wires, which are carried great distances overland, they are said to be frequently cut down by the scarcely less wild aborigines, who manufacture from them rings, armlets, and other varieties of barbaric ornament. It has been suggested as a means of protection in this case, that the posts should be constructed of iron, when the battery could be used to astonish any native climbing them with felonious intent.

Governor's Island for the World's Fair.

The latest site proposed for the World's Fair of 1883 is Governor's Island. The island lies in New York Harbor, about half a mile south of the southern extremity of the city, and is about a mile in circumference. The proposer says:

"Here would be 'room and verge enough,' and to spare; and in the requirements it surpasses in many particulars all other suggested sites. Access to the island could be had by steamboats by means of a pier which should extend several hundred feet from, say, the north shore. Specially constructed and arranged ferryboats could ply to the island, connecting with New York at its lower part, and higher up on the North and East Rivers, and also with Brooklyn, Jersey City, etc. The pier would also afford facilities for excursions to the Exhibition by steamers from the principal river and seacoast cities and towns of the New England, Middle, and Southern States. This direct water communication would largely contribute to the success of the Fair by affording quick and non-fatiguing, as well as cheap means of travel from and to distant sections of the country. In addition there might be a bridge of boats across Buttermilk Channel connecting the island with the shore of Brooklyn."

The great objection to this site would seem to be the circumstance that the island is a fortified post of the United States, and not likely to be surrendered for the purposes intended. Besides, it would furnish no proper site for the permanent buildings to be erected by the city and State.

A Fatally Polluted Stream.

A distressing case of wholesale poisoning, through criminal ignorance or worse, has just occurred in a country school, in Vermont. The school opened Monday, May 26, and as usual the children got their water from a little brook that ran close by. The teacher noticed the bad taste of the water and forbade its use; but the caution came too late or was neglected, and in a little while seventeen of the children were prostrated with alarming illness, ten or twelve dying within a day or two, the bodies of the dead corrupting so rapidly that immediate burial was necessary. Investigation showed that a farmer had polluted the stream by the carcasses of a horse and several sheep, and the drainage of his barnyard. A medical investigation resulted in a report that diphtheria was the cause of the terrible mortality, aggravated by poisoned water. Diphtheria in a mild form had been in the vicinity, and four cases were known to exist, so that water poisoned by barnyard drainage and putrid carcasses of dead animals was just the thing to feed the disease into the development of the terrible disaster. One would think that the putrid carcasses would sufficiently account for the fatal pollution of the water.

Prejevalsky's Expedition to Lhasa.

If no mishap has befallen the Russian explorer, Colonel Prejevalsky, he is now pushing across the great sandy desert traversing the western center of the Chinese Empire, somewhere in the neighborhood of Suchau. His intention is to proceed across the marshy Tsaidam district to the Tibetan plateau; then, after joining the usual caravan route from Koko Nor to Lhasa, he will proceed as far as the latter city, which is the great object of the present expedition, and if possible make an excursion into the unknown country to the southeast, where Tibet abuts on the extreme eastern Himalayas. He proposes to return partially by the same route, but eventually to deviate toward Khotan and Kashgar. The entire journey is estimated to last two years. The expedition is fully equipped with money, firearms, and ammunition, and meteorological and astronomical instruments.

Eight Minutes Under Water.

A boy seven years of age was seen to fall from a bulkhead into the Hudson River, June 2. After considerable delay a youth named Thomas Berry came to the rescue, and the spot where the boy sank was pointed out to him. By a plucky dive and a long swim under water he succeeded in recovering the boy, who had been in the water eight minutes, and was apparently lifeless. A successful effort was made to resuscitate him, signs of returning consciousness appearing at the end of twenty minutes. The officers of the patrol of the water front pronounced this the most remarkable case of resuscitation after long submergence that had come within their knowledge, and it was put upon record as such. The happy issue should encourage hope and persistent effort in all similar cases.

The Forster-Firmin Amalgamator Co.

In the SCIENTIFIC AMERICAN of November 2, 1878, the Forster-Firmin system of amalgamating the precious metals was described and illustrated. The first annual report of the officers of the company controlling the system indicates a promising future for it. Machines are now building for use in Arizona and Idaho, and arrangements are being completed for their introduction in Colorado and California. It will be remembered that by this process the mercury is atomized by steam, compressed air, or other equivalent medium, and forced through a stream of pulverized ore. By this means, in connection with their system of washing and settling, the inventors claim to obtain all the precious metal in the ore, and also to recover nearly if not quite all the mercury used; the economy of the process being such as to make the system profitable with poor ores.

THE ISTHMUS CANAL.

The International Canal Congress came to a decision May 28, adopting by a vote of twenty-nine to sixteen the Wyse Panama canal without locks. This project, it will be remembered, contemplates a canal, substantially along the route of the Panama Railway, nearly 45 miles long, with a tunnel 3¼ miles in length. To this project the President of the Congress, M. de Lesseps, was committed from the start, and it was through the influence of its projector that the Congress was called. The local influence brought to bear in its favor was irresistible, the result showing a splendid victory of social over civil engineering. M. de Lesseps immediately began the formation of a company to carry out the project, announcing that a first subscription of 400,000,000 francs will be opened simultaneously all over the world about September next. It is to be an essentially popular loan, without government aid or guarantee. The amount of the first subscription, of which 10 per cent is to be paid on subscribing, will, M. de Lesseps expects, be more than covered. Mr. Nathan Appleton will be a director of the company, and will be delegated to open subscriptions in the United States.

It is also announced that M. de Lesseps intends to proceed to Panama, by way of New York, to take out the first spadeful of earth on the 1st of January, 1880. The intention is to have the canal open for commerce before the year 1900; a result we reckon to be contingent on clever financial engineering rather than on social or civil engineering, great as may be the problems thrown upon the resources of the last.

American Society of Civil Engineers.

The eleventh annual convention of the American Society of Civil Engineers will be held at Cleveland, Ohio, beginning Tuesday, June 17. From the list of topics to be considered and the names of those expected to contribute papers and take part in the discussion, it is safe to predict an enjoyable and profitable meeting. During the meeting the Society will visit Pittsburg to inspect the government works for the improvement of the river at that place.

James Orton Woodruff.

Those who were interested in the Woodruff Scientific Expedition will be pained to hear that its projector died at his residence in this city, June 4, of brain disease, brought on by the care, anxiety, and overwork connected with his great enterprise, which was temporarily abandoned May 8. Mr. Woodruff had just developed a new plan, which had been accepted by Prof. Clarke and others interested, when inflammation at the base of the brain terminated his life.