

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.

Remit by postal order. Address MUNN & CO., 37 Park Row, New York.

To Advertisers.—The regular circulation of the SCIENTIFIC AMERICAN is now Fifty Thousand Copies weekly. For 1880 the publishers anticipate a still larger circulation.

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 10 cents. Sold by all news dealers 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, 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 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., 37 Park Row, New York.

NEW YORK, SATURDAY, DECEMBER 6, 1879.

Contents.

(Illustrated articles are marked with an asterisk.)

Academy of Sciences, New York, 353
American industries, 357
American institute of architects, 353
Anasconda, crushed by an, 354
Astronomical notes, 356
Commercial enterprise, 357
Dairy fair, international, 356
Dead, preservative of the, 359
Electrical generator, Edison's, 359
Fire losses, 352
Fish, cross-breeding among, 350
Gas well and carbon factory, 352
Gelatine, purifying, 351
Glass tubing, 351
Haymaking, artificial, 358
Hughes micro and Blake trans, 350
Ibex, the, 359
Industries, American, 357
Inflammable goods, a ban on, 353
Inventions, agricultural, 351
Inventions, mechanical, 353
Inventions, miscellaneous, 357
Letters patent, 352
Linen Company, Williamite, 351
Masters and apprentices, 356
Mining tunnel, Colorado, 352
Motor, tramway, new, 354
National public health assoc'n., 353
Natural history notes, 359
Near-sightedness, 351
Notes and queries, 353, 354
Projectile, military, new, 350
Reading room, British museum, 351
Red Sea, where Israelites crossed, 354
River, Manchester and Liverpool, 354
Screw driver, improved, 358
Lag boiler covering, 351
Steamer, Cunard, new, 358
Steam fitter, young, hints to, 355
Telegraphic system of the world, 352
Telegraphy in France, 352
Towboat, Western, 352
Towing, steam, on the Erie canal, 350
Trade mark decision, a, 352
Tribute, handsome, a, 353
Volcanic products of the Pacific, 359
Wagon hardware trade, 353

TABLE OF CONTENTS OF THE SCIENTIFIC AMERICAN SUPPLEMENT No. 205.

For the Week ending December 6, 1879. Price 10 cents. For sale by all newsdealers.

I. ENGINEERING AND MECHANICS.—Shafting, Couplings, and Hangers. 9 figures.
Machinery from an Insurance Point of View. By A. J. BATES. (Continued from No. 204)
How to Prevent the Rapid Spread of Fire. Architectural remedies for the rapid spread of fire through buildings.
Principles of Horseshoeing. Valuable advice by Dr. GEORGE FLEMING, V. S., London.
Shingle Manufacture.
Advantages of Cumberland, Maryland, as a Manufacturing Center.
II. MINING AND METALLURGY.—The Lexington Oil Belt, Santa Clara County, California. Recent developments. Promising wells.
The Sutro Tunnel. An address before the Bullion Club, by ADOLPH SUTRO.
III. TECHNOLOGY AND CHEMISTRY.—Bracewell's Improved Bleaching Kier. 2 figures.
Wood Stains.
On Gelatino-Bromide of Silver. By D. VAN MONCKHOVEN.
Heliotype Printing Plates. How prepared.
A New Quantitative Analytical Method of Extensive Applicability. Prof. A. Claassen's process.
Turkey Red Oil. By G. STEIN.
Determining Sulphur. By ALBERT COLSON.
Compound Nature of Phosphorus. By N. LOCKYER.
Spongy Silver.
Fast Scarlet without Cochineal.
IV. ELECTRICITY, LIGHT, ETC.—Carre's Di-electric Machine 2 figures.
1. The friction machine. 2. The di-electric induction apparatus.
The Most Powerful Telescope in Existence. By E. NEISON.
V. MEDICINE AND HYGIENE.—Curious Case of Loss of Personal Identity.
The Eucalyptus and the Pine Considered in Relation to their Sanitary Properties. By C. T. KINGZETT.
Neuralgia Cured by Nerve Stretching.
Anti-fat.
VI. NATURAL HISTORY.—The Orang-Outang of the Garden of Acclimatization, Paris. 1 full page illustration.
South African Baboons. Notes by H. N. MOSELEY.
The Orang-Outang. 11 figures. The orangsin Paris.—Orang-outangs in Borneo.—The orang's fighting propensities.—The orang and evolution.
The Homing Instinct in Pigeons.
Phylloxera.
Hedge Hog and Viper.
VII.—ARCHEOLOGY.—New Explorations of the Ruins at Palenque, Mexico. By M. F. MALER. 2 figures.

THE TRADE MARK DECISION.

The three cases of the United States against Emil Steffens, Adolph Witteman, and W. W. Johnson—all prosecutions for violations of the trade mark laws embodied in sections 4,937 to 4,947 of the Revised Statutes—were decided by Justice Miller in the United States Supreme Court, at Washington, November 17. The lower courts had been divided in opinion as to the constitutional power of Congress to legislate on this subject. It was maintained by counsel who sought an affirmative answer to the question that two clauses in the Federal Constitution furnish sufficient warrant for the legislation in dispute, namely, the 8th clause of section 8, article 1, which provides that Congress shall have power to pass laws to promote the progress of science and the useful arts by securing for limited times to authors and inventors the exclusive right to their inventions and discoveries; and the third clause of the same section, empowering Congress to regulate commerce between the States and with foreign nations. The court declared the attempt to identify trade marks with works of authorship and invention to be surrounded by insurmountable difficulties. If the symbol, however plain, simple, old, or well-known, had been first applied by a claimant as his distinctive trade mark, he could by registrations secure the right to its exclusive use. While such legislation might be a judicious aid to common law on the subject of trade marks, and within the competency of legislatures whose general owners embraced that class of subjects, the court was unable to find any such power in the constitutional provision concerning authors and inventors.

With regard to the argument that a trade mark is used to identify a particular class or quality of goods, and that as so used it is a valuable aid or instrument of commerce, and comes within the scope of the constitutional provision cited, the court held that the clause quoted does not bring within the control of Congress every species of property which is the subject of commerce, or which is used in commerce (Wallace vs. Louisiana, 8 How. 73; Paul vs. Virginia, 8 Wall. 168), and that the legislation in question did not limit the use of trade marks to inter-state or international commerce, as it should do if based on the constitution or provision quoted in its support. If it referred to all trade and to commerce between all points, it was obviously an exercise of power not conferred upon Congress. That this was the purpose of the legislation in question seemed, in the opinion of the court, to be evident. It contemplated the establishment of a universal system of trade mark registration for the benefit of all who had already used a trade mark, or who wished to adopt one without regard to the character of the trade to which it was to be applied or to the locality of owner. Such legislation was, in the opinion of the court, in the excess of Congressional power. It had been urged that if Congress had power to regulate trade marks used in commerce with other nations and among the several States, its legislation, so far as it related to that class of cases, should be held valid; but to this the court held two objections: First, that there was nothing to show that the trade marks in the three causes under consideration were used in that kind of commerce; and, second, that it was not within judicial province to give the words used by Congress a narrower meaning than they were manifestly intended to bear. To do so would be virtually to make a law which would be only partial in its operation, and which would complicate rights which parties would hold in some instances under acts of Congress and in others under State law. The question of the treaty-making power of the General Government over trade marks, and the duty of Congress to pass any laws necessary to carry such treaties into effect, was left untouched. The only question in the three cases under review was whether the statutes of 1870 and 1876 could be upheld in whole or in part as valid and constitutional, and that the court answered in the negative.

From this decision many have hastily inferred that no protection remains for the property rights of merchants and manufacturers in trade marks, and no means of preventing the markets from being flooded with spurious wares bearing well-known and respected labels. But such is not the case. Those who have been using trade marks have acquired a common law right to them; and in case they are counterfeited their owners can at once bring suit at equity to restrain and to recover damages in the courts of any and every State where the infringement occurs; or in the United States courts in case the litigants are citizens of different States.

The advantages of the laws which have been declared unconstitutional lay simply in their enabling all suits for infringements of trade marks to be brought in United States courts, and in providing for a formal registration of trade marks by the Patent Office, the certificate of which was accepted in all the courts of the country as prima facie evidence of ownership. Another advantage of such registration arose from the facility it afforded for determining whether a desired trade mark had been previously adopted by another, thus preventing unintentional infringements. It is proper to add that this decision does not in any way affect the protection of trade labels by copyright.

The Patent Office will continue to register trade marks as heretofore, notwithstanding the unconstitutionality of the laws upon which such registration has been based, trusting, doubtless, to prompt action on the part of Congress to furnish the necessary legislation for the permanent continuance of the work. Should this fail, Congress will no doubt provide by appropriate legislation the means for returning

the fees received for the 8,000 or more trade marks thus far registered.

A WESTERN TOW-BOAT.

The Pittsburg coal firm of W. H. Brown & Co. have just completed and added to their fleet of tow-boats the Harry Brown, a typical Western river tow-boat, being the most powerful and complete high pressure craft of its kind afloat. The peculiar and hazardous conditions which attend the safe delivery at New Orleans of a "tow" (from 200,000 to 500,000 bushels) of Pittsburg coal cannot be fully shown here, nor are they likely to be clearly comprehended by any but river men. The first 500 miles below Pittsburg comprises a succession of tortuous windings, of shoals and "riffles," and bars and counter-currents. To successfully run this gauntlet with a cumbersome, deeply laden tow, containing tens of thousands of tons of coal, boats of the Harry Brown type are required, with light draught and enormous steering as well as propelling power. Their pilots must have absolute control over a rigid mass that often takes up all the available water in the channel, both as to width and depth. To render this possible the Western river man places his boat behind his fleet of coal-laden boats and barges, and by means of great hawsers binds the whole mass of a score of craft into a solid "tow."

On the Ohio, and Mississippi rivers the Hudson River or canal system of towage would be utterly useless. Hence in the Harry Brown's construction features unintelligible to Eastern boatmen may be noted. Her dimensions are as follows: Length on deck, 210 feet; beam, 42 feet, over all, 52 feet; hold, 5 1/2 feet. Engines, one pair, high pressure, 26 and 3/8 diameter of cylinders, 10 feet stroke. Seven steel boilers, 40 inches diameter and 28 feet long, furnish the necessary steam, at 170 pounds pressure, test pressure of boilers being 260 pounds hydraulic. An auxiliary or "nigger" boiler, 38 inches by 10 feet, supplies steam for engines operating capstans, etc. The wheel, located at the stern of the boat, is 26 feet 4 inches in diameter, length of buckets, 32 feet, each bucket or paddle being 32 inches in width. The wheel shaft, upon which the greatest strain is brought to bear, and upon which the safety of boat and tow depends, is a special feature of the Harry Brown, being the first wrought steel shaft ever imported and used upon a river tow-boat. It is of crucible steel, from the works of Krupp, at Essen, and weighs alone 20,600 pounds; with flanges, etc., 40,000 pounds; and cost 13 cents per pound delivered in New York. Its dimensions are: Length, 36 feet 7 inches; diameter at journals, 13 inches; in center, 15 inches. Rudders, four in number: one pair, balanced, 25 feet long; one pair, wing, 14 1/2 feet long; actuated by steering wheel, 12 1/2 feet in diameter, with 16 inch barrel.

Ready for business the Brown draws only 3 feet 4 inches forward and 3 feet aft, a great desideratum, enabling her to return to port during a season of low water. In service, and to maintain steam at 170 pounds, the boilers will evaporate 5,000 gallons of water per hour, and the engines evolve 1,750 horse power. This boat, with a favorable stage of water—9 to 12 feet at Pittsburg—is expected to take to New Orleans and other Southern ports from 28 to 30 loaded coal boats, say 600,000 bushels, or the total output of 6 acres of a 4 1/2 foot vein of Pittsburg coal. Such a tow measures 850 by 200 feet, and reduced to tons of 2,000 pounds, contains 22,800 tons. A loaded coal boat draws from 7 1/2 to 8 feet, a barge from 6 to 7 feet. The former's load is 23,000 to 25,000 bushels, the latter 12,000 to 13,000 bushels.

In the Harry Brown is embodied every feature that long experience could suggest or money procure to make her the model of her class. At present prices for iron, etc., she could scarcely be built for \$60,000, though her actual cost was \$50,000.

THE GREAT GAS WELL AND CARBON FACTORY AT MURRAYSVILLE, PA.

About a year ago, in boring for oil at Murrysville, near Pittsburg, Pa., the boring tools tapped an extraordinary vein of natural gas. The flow was estimated at about 50,000 cubic feet per hour. Recent measurements show that instead of decreasing, the present flow is fully 10,000 feet per hour greater than the first estimate, while the pressure at the mouth of the well is 90 pounds per square inch. This enormous quantity of natural fuel has, up to this time, been mostly wasted, but will soon be utilized for the manufacture of carbon black, or "lamp" black, as it is more commonly called.

A Pittsburg firm, Messrs. Sherriff & Hazely, are at work upon a contract for the machinery and fittings of what will probably be the largest carbon black factory in the world. The appliances for collecting the soot from the Murrysville gas are the following: Near the well is erected a frame building, 300 by 175 feet, and into it the gas is led in four parallel lengths of 250 feet each, of 2 inch gas pipe. Along the sides of these are fitted short branches of 1/2 gas pipe, terminating in a slight upward curve and tipped with ordinary gas burners of 6 foot per hour capacity. Above these burners, at a distance of 10 inches, are placed a series of cast iron plates, contiguous and forming a smooth surface whereon the carbon black is deposited. A small car traveling on rails laid between burners and plates, and furnished with a scraping device, plies forward and back every ten minutes during the twenty-four hours. This carriage is propelled by steam

power, operating through wire rope and suitable gearing, drums, etc. The smoke or carbon black is scraped into pans hung upon the car, and these are dumped at each end of the route into receptacles, which are in turn emptied and deposited in the purifying and packing house. After simply removing cinders, etc., by passing through sieves, the soot is ready for the market. The daily product of this plant will be $\frac{1}{2}$ pound carbon black per burner, *i. e.*, 2,000 pounds, there being 4,000 burners. Another plant of 4,000 burners is to be erected, the 8,000 burners to turn out two tons of carbon black daily. There will then still be 12,000 cubic feet of gas go to waste hourly, sufficient to light a good sized town. The owners of the Murraysville gas well refused \$20,000 for it from the Edgar Thomson Steel Works, of Pittsburg, who wanted to connect the well with their works by a gas main, about 15 miles in length.

The phenomenon of an invisible gaseous substance issuing from the earth made visible, condensed into solid form, and packed up for market is strikingly illustrated in this establishment. The gas as it issues from the ground is unseen, but a given volume of it is found by chemical analysis to consist approximately (we do not mean to say absolutely and exactly) of twenty-four parts by weight of carbon and four parts of hydrogen; in other words, a quantity of the gas that weighs 28 pounds is made up of 24 pounds of carbon and 4 pounds of hydrogen. This hydrogen seems to have the power of imprisoning and concealing the carbon from human view. But carbon is carbon, whether in this gas or existing in the carbonic acid that gives pungency and effervescence to the soda water we drink, or in the lamp flame imparting its brilliancy, or in the sparkling diamond, the hardest of substances and the purest form of carbon.

The carbon that comes up in the gas well is rendered visible by separating the hydrogen from it, which is done by the heat of the flame. The hydrogen contained in the gas is burned up by uniting with the oxygen of the air, but only a portion of the carbon is burned; the unconsumed portion of the carbon, liberated by the burning of its hydrogen, rises up against the plates, where its sticks fast until scraped off as described.

NEW YORK ACADEMY OF SCIENCES.

The Chemical Section of the New York Academy of Sciences met Monday, Nov. 9, Prof. Newberry in the chair.

Mr. Kunz exhibited a specimen of fluorspar, one half of which was of an amethyst tint, and which had been fashioned into a rude ornament. It was found near Elizabethtown, Harden county, Ill., where fluorspar occurs in immense deposits.

He also exhibited a rock crystal pitcher of exquisite workmanship. It was made of an unusually large piece of crystal, and is without a flaw. Messrs. Tiffany & Co., to whom it belongs, value it at about six hundred dollars.

The paper announced for the evening was on the

ADULTERATION OF FOOD,

by Prof. A. R. Leeds, of the Stevens Institute of Technology, who had undertaken the investigation of a large number of articles of domestic consumption as a part of the work devolving upon him by his connection with the New Jersey Board of Health.

Prof. Leeds prefaced his remarks by the reassuring statement that many of the fears awakened in the public mind by the discussions in the newspapers concerning the deleterious or even poisonous character of various substances said to be used in the adulteration of many articles of food are entirely groundless, and that the most searching analyses in his own laboratory failed in nearly all cases to reveal their presence, although the articles tested were for the most part purchased at the meanest shops, whose custom consisted of the poorest class of the community. The adulterations found consisted mostly of substances harmless in themselves and used for the purpose of increasing the weight or bulk of the articles sold. Such adulteration must of course be branded as fraudulent; but while it is an offense against public morality, it is not one against public health. The following are some of the articles examined.

It has been objected to by some that bread is adulterated with potatoes, but this addition, so far from being injurious, actually improves the quality of the bread. A few samples of bread contained very small quantities of alum, said to be used for the purpose of making it whiter and lighter. Some contend that a very little alum is not injurious because it is rendered inert by the phosphate of lime contained in the flour, and also by the acids of the gastric juice. Not the slightest trace of copper was revealed in the bread examined by the most searching methods of analysis. Saleratus was found in nearly all cases to consist, as it should, of perfectly pure bicarbonate of soda; but cream of tartar was found to be adulterated in some cases as much as sixty per cent. with terra alba. Baking powders, which should consist of bicarbonate of soda and cream of tartar in suitable proportions, kept from combination by the admixture of a little starch powder, were found to vary greatly in the amount of their effective constituents. All the sugars examined were found to be perfectly free from all injurious substances, while the cheaper grades of sirups contained considerable glucose, a substance much inferior in sweetening power to cane sugar. No trace of strychnine, cocculus indicus, or other poisons popularly supposed to be used in the manufacture of liquors, beers, etc., were discovered. No sulphuric, nitric, or hydrochloric acids were found in vinegar. All the samples examined derived their activity from acetic acid, of which, how

ever, they contained different proportions. In other words, some of them were more or less diluted with water. None of the samples of milk examined were found to contain any more serious adulterant than water. A diligent search was made to find brightly colored cucumbers whose tint would seem to indicate that copper had been used to make them more attractive; in none of them, however, was even the faintest trace of copper found to be present. Canned goods were found to be free from all deleterious substances. Spices procured from various sources differed greatly in strength, and all contained foreign substances increasing their bulk and diluting their pungency. Different samples of teas examined chemically and under the microscope revealed the fact that they were adulterated by leaves of other plants to a very great extent. Some of the cheapest kinds, selling (say) for 35 cents a pound, contained no tea leaves whatever. Candies were found to be much more free from injurious substances than the public has been led to believe. Many of them contained a large admixture of glucose, but the coloring matters used were comparatively harmless. In some of them aniline colors were used, which, although poisonous, cannot be fairly so-called in the very minute quantities necessary to color candy.

Prof. Leeds also examined green wall papers for arsenic, and exhibited several tubes containing arsenic extracted from them. These papers must be condemned as highly injurious, especially as the arsenic is but loosely applied to the surface and is easily diffused through the air, whence it finds its way into the lungs. One specimen of arsenic shown was extracted, curiously enough, from a little green Christmas tree candle.

He concluded his paper by remarking that three things were necessary to keep the practice of adulteration in check: a strong public sentiment kept aroused by the public press; the enactment of stringent laws; and the appointment of competent persons to execute them.

Mr. Kunz remarked that a firm in New York city made a fortune by selling cocoanut shells to the manufacturers of spices, who ground them up to increase the bulk of their products.

Capt. Blake stated that it was perfectly impossible to buy pure tea at 35 and 50 cents a pound, seeing that a good article costs \$1 a pound at Fouchow. C. F. K.

The New York Academy of Sciences met Monday evening, November 17, President Newberry in the chair. A large number of minerals was exhibited, among which a rough diamond from Brazil and a diamond crystal from South Africa attracted much attention. They were shown by Mr. Kunz, expert in gems at Tiffany & Co.'s. The first paper of the evening was on some

RECENTLY DISCOVERED CAVES,

by Prof. Newberry. A great many caves having been discovered in this country within the last few years, it may not be wholly devoid of interest to those who have not made them the subject of special study, to describe the method in which they were formed. An excellent illustration is furnished by the triangular plateau of Central Kentucky, which, like all the formations abounding in caves, consists chiefly of limestone rock. This rock, by its numerous fissures and joints, as well as by its solubility in water charged with carbonic acid, is peculiarly liable to be attacked by the action of rain water, which always contains a small percentage of carbonic acid. The surface of this plateau is always dry, and no rivulet or brook is found upon it. The rain almost immediately finds its way to the underground channels which previous rains have hollowed out, and continues the work of excavation. At first the natural joints or seams of the rock are widened into fissures, and then, where some portions are more soluble than others, these fissures are further hollowed out into caves, some of them twenty and thirty and even more feet long, whose ceilings and floors are adorned with beautiful stalactites and stalagmites deposited from solution as the water containing carbonate of lime slowly filters in and evaporates. In this way immense tracts of country, where limestone is the principal formation, are literally honeycombed with subterranean caves. The Mammoth Cave itself is a member of such a system of caves. In many cases, especially in the region of the Upper Missouri, and between the Rocky Mountains and the Sierra Nevada, the same volcanic action that upheaved the limestone also brought up from below springs containing metallic substances in solution. These substances were then deposited in the fissures of the rock and also on the walls and floors of the caves. The most common are ores of iron, such as limonite, and of lead, such as galena. Many fortunes have been made and lost again by those who made it their business to explore these limestone regions for caves containing lead. The method followed is that of simply sinking wells at intervals and examining the excavated minerals. In this connection Dr. Newberry told an amusing story of an enterprising individual who had spent several fortunes acquired in this way. When at length his purse was nearly exhausted, he spent his time driving around the country to examine the wells dug by others in the hope that his superior experience would enable him to recognize signs of mineral deposits which had escaped the eyes of others. He succeeded in purchasing an unpromising looking well for a hundred dollars, and, upon exploring it, he found sufficient indications to warrant him in buying up considerable land around. When he had established his title, he descended his well alone to continue his search. To his great surprise, he struck a passageway leading into a cave that

contained thousands of tons of lead ore. He jumped down into it, stuck his candle into the sand, and began to reflect how he could apply his new fortune to a better purpose than his former ones. His pleasant reverie was, however, brought to a sudden close. His last candle went out, and he was left in darkness so dense that he could not find the hole through which he had entered. After many fruitless attempts he finally thought of the following very sensible method. As he tried each spot along the walls of the cave by raising his pickaxe above his head and feeling his way with it, he marked the place with a stone. He finally regained the upper regions hungry and faint, after an imprisonment of forty-eight hours. Notwithstanding his good resolutions, the new fortune did not last much longer than the old ones.

The caves found between the Rocky Mountains and the Sierra Nevada, in the region of the lost mountains, so-called because short mountain chains rise there at intervals from a perfectly level surface, are distinguished by the fact that they contain the precious metals associated with iron and lead: gold with iron pyrites and silver with galena. The celebrated Emma mine and the Eureka are examples of this kind of deposit. The fluctuations in the value of mining stocks of this kind depend upon the beautiful uncertainty as to the continuity of the deposit. It may "pinch out"—that is, become so insignificant at any time that it will not pay to work any longer; and then again it is just as likely that new openings into rich deposits may be found.

The next paper was on a new proof of the

SUBSIDENCE OF OUR COAST,

by Prof. G. S. Martin. He exhibited specimens of peat that had been washed ashore at Long Island. They were similar to those found by Scudder on the Nantucket beach, and by Dall at Nahant. Their appearance indicated that they had been burrowed into to such an extent as to cause them to be broken by the action of the waves and detached from ancient peat bogs, whose edges crop out along the coast under the surface of the sea. These bogs, which belong to the period of glacial, or perhaps to that of terrace, elevation, thus furnish an additional evidence of the subsidence of portions of our coast extending through long periods of time. C. F. K.

The American Institute of Architects.

The thirteenth annual convention of the American Institute of Architects began in this city, Nov. 19, nearly all the chapters being represented. In his annual address, President Walter spoke very hopefully of the influence exerted by the organization in raising public opinion to a higher level in all matters pertaining to architecture. Works of recent date exhibit, he said, a freshness in their architectural handling that seems to indicate the advent of a new era in the art of design. The manifest tendency of architects to break away from the trammels of conventional rules, and to make style subservient to the spirit of the age, indicates a progress in the development of independent thought hitherto unknown. Architecture, both in this country and in Europe, is obviously in a transition state. What may be the result remains to be seen; if, however, architects are careful to design their works on true æsthetic principles and in conformity with the science which underlies the art, it is not likely to be regretted that they show a disposition to do their own thinking. Classic forms and combinations are everywhere yielding to more ornate compositions bearing the names of fashions of building having no trace whatever of paternity, either ancient or modern. Particular stress was laid upon the claims of domestic architecture, particularly with reference to improvements in processes for warming and ventilating dwelling houses, the disposition of sewer gas, drainage, and other sanitary questions.

THE NATIONAL PUBLIC HEALTH ASSOCIATION.

The annual convention of the American Public Health Association took place at Nashville, Tennessee, Nov. 18. Over two hundred members were present at the first session, including nearly all the leading sanitarians of the country. The programme announced some weeks since in this paper contained many subjects of interest and importance to the whole country; and there is reason to expect large public benefits to flow from the united attention brought to bear upon the great questions of public sanitation treated in the numerous papers and discussed by the members.

The description of Ward's steam generator, on page 323, of current volume, states that the generator furnishes steam to a single engine. Mr. Ward informs us that it supplies steam for two engines, $9\frac{3}{4}$ cylinders, 36 inch stroke, making 35 revolutions per minute.

A Ban on Inflammable Goods.

In consequence of recent disclosures the directors of the North German Lloyd's Steamship Company have decided to refuse transportation on their vessels to the class of heavy French silks which are so weighted with chemicals and oils as to cause danger of spontaneous combustion.

A HANDSOME TRIBUTE.—The Lords of the British Admiralty have given orders for the making of a handsome piece of furniture from the timbers of the old Arctic exploring ship *Resolute* for presentation to Mrs. Grinnell, the widow of the late Henry Grinnell, of New York, who fitted out at his own expense two expeditions for the search of Sir John Franklin.