nish a means of diminishing, by one-half, the duration of each operation and consequently each local obstruction. But since, on another hand, the work as a whole to be effected would take half the number of days by night. work, half of it might first be done in the same period of time, and then the rest of it, and the general obstruction of the city would be reduced to a quarter, while at the same time lasting as long as at present. There would certainly be some expense connected with the organization of a plant of this kind, but would not this be made up by the greater rapidity with which the work would be performed? For it is certain that work performed in a continuous manner, by gangs of men that relieve one another, will be finished more promptly than if it were discontinued and begun again every day. With night work, the bridge Des Saints Peres would have now been given up to travel, while as it is it will be closed for a long time to come.

## .....

## Incident Relating to Professor Atwater,

A memorial of the late Professor Lyman H. Atwater, of Princeton College, who died last June, has just been published. In the memorial sermon of Rev. Wm. M. Taylor is issued weekly. Every number contains 16 octavo pages, uniform in size the following incident is related: At the beginning of Dr. \$5.00 a year, postage paid, to subscription for SUPPLEMENT, Sold by Atwater's final illness he would lie for hours as though all news dealers throughout the country asleep. After his partial convalescence he said to members of his family that when they had, doubtless, thought him to be sleeping he was in reality thinking with unusual energy; that his mind seemed stimulated to extraordinary acuteness on very profound subjects, reaching with great rapidity conclusions which in health would have been arrived at only after much longer thought. He added that he would like. to get well enough to put some of those thoughts on paper, but he never gained his wish.

#### .....

#### To Raise Plants.

A lady, whose beautiful plants are the delight of her life and the envy of all her acquaintances, revealed the secret of The SCIENTIFIC AM MILICAN Export Edition has a large guaranteed circu-her success for the benefit of the readers of the *Evening* lation in all commercial places throughout the world. Address MUNN & Post the other day. The soil is, she says, about two-thirds good garden soil, and the rest is sand. It is kept light and loose about the roots; they are watered as they appear to need it, and not according to any particular rule; but the chief reason for their wonderful growth and bloom is this: "When any of the leaves wither and fall, instead of picking them up and throwing them away, I make little rolls of them and tuck them down in the earth and let them decay; and this is the only fertilizer I have ever used. This," she added modestly, "seems to be nature's way. And the plants that have the afternoon sun only, grow and rival those that have the morning sun."

## Death of Dr. Gale.

Dr. Leonard D. Gale, an old well known scientist, and for a number of years an examiner in the chemical class at the Patent Office, died in Washington on October 23, at the age of eighty-three. He was a great friend of Prof. Morse, and assisted him in building the first telegraph line between Washington and Baltimore. Dr. Gale went to Washington in 1846, and has since resided there. It was said in the early days of the electric telegraph that Prof. Henry's discoveries in electricity contributed very much to Prof. Morse's success, and that Dr. Gale was the mutual friend of both.

More than thirty years ago the writer became acquainted = with Dr. Gale while an examiner in the Patent Office. He was greatly respected by his associates and those having official business in his department at that time.

## ----Vegetable Wool.

The Monitour des Fils et Tissus calls attention to a description of vegetable wool called Kapoc. It comes from Java, and a specimen is on view at the Amsterdam Exhibition. It arrives at Amsterdam in its leathery covering, being itself enveloped in the seeds. It is then freed from both, and is carded so as to make a very light mattress wool, worth about  $8\frac{3}{4}d$ , per pound. One of the houses engaged in this operation had made trials in spinning and dyeing this material, but the filaments are said to be like strings, and their industrial application consequently a matter of uncertainty.

#### ..... A Car Load.

Scientific American.

## [NOVEMBER 10, 1883.

#### SUBSTITUTION OF STEEL FOR IRON.

Builders of machinery and machine tools are rapidly substituting low steel for refined iron in the parts of machines subjected to strain, and yet requiring stiffness. Low steel is extensively used in drop forging, and for many objects is preferred to Norway or Swedish iron. It will bear as soft heating, leaves cleaner lines, and is superior in stiffness, although it is exceedingly tough and fibrous. For piston and valve rods, for small finished shafts, rod connections, and many other uses heretofore filled by iron, steel is now generally preferred. When well made and rolled or hammered into rods and small bars, the toughness of this sort of steel is remarkable; a specimen recently noticed being a bar seven-eighths of an inch in diameter, doubled cold, and the bend hammered flat under a heavy atmospheric hammer without breaking the fibers. But one of its best qualities is its rapidity of being worked, and the cleanliness of the job.

The steel is measurably pure, containing no "sand bars," or spiculæ of hard iron, that either take the edge off the turning tool or the planer cutter, or break the points off. The cutter may be set to size in a lathe or on a planer, and the steel works so even that the calipers or the try gauge is scarcely required for a run of several feet continuously. This steel is admirably adapted for the feed screws of lathes, particularly for screw cutting lathes; the thread being cut so clean that it will gauge to the one-hundredth part of an inch before taking the scraping or finish chip. The durability of steel as compared with iron is so much greater that the value of the rolling and sliding parts is largely enhanced, and fits can be made with much closer accuracy, while the increased first cost of material is nearly, if not quite, made up in the greater facility of working,

## NOVEMBER METEORS.

The earth will break her way through the November meteor-zone about the 13th of November, and proof of her passage will be furnished by the appearance of a few meteors proceeding from the constellation Leo at the time indicated. The meteor-zone is so broad that it takes the earth two or three days to traverse it, and the nights of the 12th, 13th, and 14th are the times to watch for the meteors. It will be necessary, however, to wait till 1899 for a grand star show, as this immense group of tiny atoms travels in an ellipse of such vast dimensions as to require  $33\frac{1}{4}$  years to complete a revolution. The reason we do not have a star shower every November is because the meteors, instead of being uniformly distributed throughout the zone, are principally collected in a great group in one part of it. If the earth crosses the zone at a time when the principal group is in the part she is crossing, we have a shower that forms one of the most grand and brilliant sights ever seen on this planet. About a dozen of these magnificent November showers are on record. The Chinese, Arabian, and other historians have handed down many accounts of the wonderful meteoric showers. An Arabian writer reports: "In the year 599, on the last day of Moharrum, stars shot hither and thither, and flew against each other like a swarm of locusts; this phenomenon lasted until daybreak; people were thrown into consternation, and made supplication to the Most High; there was never like seen except on the coming of the messenger of God, on whom be benediction and peace."

In 1799 Humboldt, then traveling on the Andes, saw before sunrise thousands of meteors in the space of four hours, leaving a track behind them from five to ten degrees in length, many of them having a nucleus as bright as Jupiter. In 1833 there was a shower marked by grandeur and sublimity. The meteors passed over the heavens like flakes of snow, and, according to Arago's estimation, two hundred and forty thousand of them fell in three hours, as seen from his place of observation. In 1866 the latest shower was observed in Europe, and a portion of it was seen in America in 1867. The next shower is due in 1899, and is eagerly anticipated in the hope that it will confirm several theories based upon present and previous observation.

zone, when the grand showers will cease, and a display of ler proportions will take place every year. y of the November meteor-zone is a romance of tronomy. According to Leverrier-and some his theory need confirmation-about the year 126 tian era, Tempel's comet passed so near Uranus erful attraction of the planet bent it from its se and imprisoned it within the hounds of the , causing it to describe an immense ellipse or op, whose aphelion lies beyond the orbit of whose perihelion rests upon the earth's orbit. tervening between the great showers, 331⁄2 years, eriod of the revolution of the meteor-zone. It ese intervals that the earth crosses the brightest e zone, consisting of the nucleus of the comet ig meteors into which it is being transformed. ber meteors start from a point in the constellad are for this reason called Leonids. Leo is tuated for observation about 3 o'clock in the nich is a good time for picking up the few stray ich, impinging against the earth's atmosphere,

# Scientific American.

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NEW YORK, SATURDA	Y, NOVEMBER 10, 1883.	
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rels of sait, 70 of lime, 90 of flour, 60 of whisky, 200 sacks of flour, 6 cords of soft wood, 18 or 20 head of cattle, 50 or 60 head of bogs, 90 or 100 head of sheep, 9,000 feet of solid  $_{\rm III}$ . boards, 17,000 feet of siding, 13,000 feet of flooring, 40,000 shingles, one-half less green lumber, one tenth less of joist, IV. scantling, and other large timbers, 340 bushels of wheat, 400 of barley, 400 of corn, 680 of oats, 300 of flaxseed, 366 of apples, 340 of Irish potatoes, 300 of sweet potatoes, 1,000 v. bushels of bran.

#### \*\*\*\* The Patriarch Chemist,

On September 1, M. Chevreul, the Nestor of chemists, vi. completed his ninety-eighth year of age. He was born at Angers, in the night of August 31, 1786. At the early VI age of 20 years he was conservator at the Museum. Among his great discoveries in chemistry, figure prominently the separation of the fat bodies and the chemical constitution of VI oleine, stearine, and margarine. To him is also due the doctrine of the contrast of colors, of their shades, and of the determination of shades.

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falling stars.

It is, however, unnecessary to wait for the earth's passage through the November meteor-zone to witness the phenome- permitting its culture but taxing the sales was tried without 'to patentees exclusively might be void; but there is no quesnon of a falling star. Hundreds of other meteor-groups have success, and on December 29, 1810, the government monobeen observed, which, excepting the August group, are not poly was resumed, and has been continued to the present competent for the State to confer upon the city the power so well defined. They are all extremely diverse, and they time. By this law the administration is alone charged with to pass such an ordinance. That the regulating of hawkers cross the plane of the earth's orbit at widely different angles. the purchase of leaves and cigars from home and foreign and peddlers is important, if not absolutely essential, may Consequently on any clear night falling stars maybe seen to cultivators and manufacturers, and with the manufacture blaze forth suddenly in the sky, rush on their headlong; and trade of tobacco in all its forms. course, and then disappear, leaving oftentimes a train of light to mark their course. Instances are on record where and in 1882 it was 362,594,000 francs, or 1,000,000 francs falling stars were of such brilliancy as to be visible in the per day. This enormous sum contributes toward the budget. daytime even, when the sky was overcast.

A surprising number of these tiny bodies fall through the atmosphere every day. The average number of those sufficiently bright to be seen at night with the naked eye is no less than seven millions every twenty-four hours. If we include the number visible through a telescope, the average | reissued March 12, 1878, No. 8, 121. Judge Wheeler held the must be increased to four hundred millions. Interplanetary space swarms with meteoric matter! The work accomplished by these systems made up of innumerable atoms of cosmical dust, their origin, the part they play in the economy of the universe, and their mysterious association with comets, are questions of the deepest interest to astronomers.

#### OSTRICH FARMING IN THIS COUNTRY.

The ostrich farm in California is reached over a sandy fringement. road leading from Anaheim, part of the way being over the farm is located comprises 640 acres of alkali soil. The same kind of soil is found in Africa, and it was considered no obstacle. To rid it of its alkaline properties, it was plowed very deep and water turned on it, a well 300 feet deep signs of the inventor. As inventor or assignee of a patented yielding many thousands of gallons of water a day. The water was allowed to remain for a while, when it was drawn off, taking with it a portion of the alkali in solution. This operation was continued until the land had been washed law. sufficiently to be put under eultivation. According to the San Francisco Bulletin, this farm has yielded three crops of alfalfa, and a fourth is ready to be cut.

The twenty-one birds on the farm were brought, in a roundabout way, some 22,000 miles, part of the distance by such rights are regulated. car. When young they are kind and tractable, but after three years become vicious and deceitful. Blindfolding them bility to make an assignment by an instrument in writing, -generally accomplished by pulling a stocking over their and make their property distinctively their own. Where a heads-takes away their pugnacity, and they will not kick, except they know what they are kicking at. The eggs are not fruitful because, the owner states, the birds are becom-assignee in an action involving their joint rights. ing acclimatized. Even if all attempts to hatch the eggs should prove musuccessful, the value of the feathers will cover the expense of tending the birds for the year.

The attempt to raise ostriches in Florida has just been commenced, three pairs of birds having been taken there.

Ostrich eggs are about six inches long by five wide, and are equal in bulk to 24 hens' eggs. The chick is hatched in 42 days, and a few days after reaches the size of a common hen. A light brown down covers it, and at the back and the mayor." For the license, when not for the sale of meat, wings are projecting needles, similar to those of a hedgehog. At the age of one month the size of a turkey is reached, and small feathers begin to appear. At one-half a year the feathers have attained a good size, but are not from door to door in said city and sold a clothes wringer. cast off until the bird becomes a yearling; young ostriches. The clothes wringers were manufactured by the defendant are kept in flocks of from twelve to fifteen, and sep- at Sturgis, in this State, under letters patent of the United rate from the old ones. Generally the feathers are cut States issued to him and one Shepardson as patentees. The off only once a year, but birds which receive special attention yield two or even three crops of feathers.

The best feathers now come from North Africa, but the crop is insignificant compared with that of Cape Colony, Natal, and the Transvaal. Since 1862, ostrich farming has greatly multiplied in those countries, and it is now estimated that there are 100,000 domestic ostriches which yield feathers worth \$4,500,000.

## **TOBACCO IN FRANCE**

The report of Consul B.F. Peixotto, of Lyons, France, gives been found deserving, is exclusive, and any State legislation was also a saving in the number of attendants, one man only a brief history of tobacco in France and the value of that in- which undertakes to limit or restrict in any manner the being required. dustry to that government. In 1560, Jean Nicot, a French privileges which the letters patent confer is an invasion of explorer who had been Ambassador to Portugal, and had the sphere of national authority, and therefore void. This Oil for Wagon Wheels. traveled in the Antilles, conceived the idea of collecting in was shown in Cranson vs. Smith, 37 Mich., 309, and what is A practical man says: "I have a wagon of which, six the island of Tabago, one of the isles of the Archipelago, a said there need not be repeated. But the ordinance in quesyears ago, the fellies shrank so that the tires became loose. plant of which the natives dried the leaves and chewed. He tion does not assume to interfere with or in any way to I gave it a good coat of hot oil, and every year since it has carried some seeds to France and planted them in his garden, abridge the exclusive rights which the patentee may lay He propagated it as an exotic curiosity, no one dreaming of claim to under his patent. The ordinance is a police regulated a coat of oil or paint, sometimes both. The tires are tight yet, and they have not been set for eight or nine years. making the repugnant use of it as did the savages. A long lation, made under the general police authority of the State, time after, when intercourse with the New World had be- and taking no notice of this or any other patent, or of the Many farmers think that as soon as wagon fellies begin to become more frequent, travelers learned the use of the way in which any salable commodity may have come into shrink they must go at once to a blacksmith shop and get the weed and imported its taste into Europe. Tobacco was existence. It is one of the customary regulations for a busi- tire set. Instead of doing that which is often a damage to then devoted to smoking, and in a powdered state was taken ness. It is well settled now, if it was ever doubted, that any the wheels, causing them to dish, if they will get some linseed As shuff. The practice obtained royal favor, and became ordinary exercise of congressional authority does not take oil and heat it hoiling hot and give the fellies all the oil they from the State any portion of its general power of police. can take, it will fill them up to their usual size and tighten popular with the nobles. The first tax was the result of a royal decree dated No- (Pervear vs. Commonwealth, 5 Wall., 475.) The acts of to keep them from shrinking, and also to keep out the water. vember 17, 1629. At first it was a custom tax, but later it Congress assume the existence of State regulations, and in If you do not wish to go to the trouble of mixing paint, you was a direct impost upon the apothecaries, who had an al- many respects would prove inoperative and confusing if it can heat the oil and tie a rag to a stick and swab them over most exclusive monopoly for its sale. But as the apotheca- were otherwise. The patent laws are as forcible for illus- as long as they will take oil. A brush is more convenient ries sold largely and reported very little, the tax was insig- tration as any other; they give exclusive rights, but they do to use, but a swab will answer if you do not wish to buy a nificant in amount. The King then took possession of the not determine personal capacity to contract or prescribe the brush. It is quite a saving of time and money to look after manufacture and sale of all tobacco, the ordinance dating requisites for sales of patented articles or impose the cus-, the woodwork of farm machinery. Alternate wetting and from September 29, 1674. Thus the druggists gave way to tomary restrictions which are supposed to be important to drying injures and causes the best wood soon to decay and contractors who would pay no more than 500,000 france; the protection of public morals. All these matters are left lose its strength unless kept well painted. It pays to keep per annum for the monopoly. The privilege increased in to the State Law. A patentee must observe the Sunday law a little oil on hand to oil fork handles, rakes, neck yokes, value until it became, in 1697, 1,500,000 francs, and in 1715 as much as any other vender; he must put his contracts in whiffletrees, and any of the small tools on the farm that are it reached 2,000,000 francs. In 1790, the consumption hav- writing under the same circumstances which require writ- more orless exposed."

30,000,000 francs.

The revenue from tobacco in 1820 was 64, 338, 834 francs, of public instruction.

# DECISIONS RELATING TO PATENTS.

In the United States Circuit Court, Southern District of New York, Fetter vs. Newhall, Drive Screw, Patent 110,839; patent to be in part valid. Also that it is not necessary to fringement. The patent gives exclusive enjoyment of the whole patented invention, and taking one feature is an infringment pro tanto.

by him, and is acting in defiance of the patent and outside Yarrow and Company, in conjunction with the Electrical the license, such license is no protection against suit for in- Power Storage Company, have fitted up a launch, which

old bed of the Santa Ana River. The land on which the the rights of minors and women to receive, hold, and convey patents. The Judge held as follows:

> The laws of Congress give the right to a patent to the inventor, whether sui juris or under disability, or to the asinvention a married woman, an infant, or a person under guardianship obtains a vested right to the patent. Married women could always take by assignment under the common

> Section 4898 Revised Statutes requires that the assignment of a patent be by an instrument in writing. The ability to make the instrument, however, or the aids to a disability must be found in the laws of the States, where all

> The laws of New York free married women from disamarried woman by her sole deed assigns an interest in a patent the assignment is valid, and she may join with such

> An interesting decision touching the right of towns and other State authorities to tax the sellers of patented goods, was given by Judge Cooley, of the Supreme Court of Michigan, in the case of the People vs. Russell.

> An ordinance of the city of Coldwater provides, among other things, that "no person shall hawk or peddle any meat, goods, wares, or merchandise from door to door within the limits of the city of Coldwater, without a license from fifteen dollars is required to be paid for one year, or three dollars for one day. The defendant was convicted under this ordinance, on evidence that, without license, he traveled defendant appealed.

> The Judge in delivering the opinion of the court, said: It is objected to the ordinance that if applied to the sale of patented articles it is an interference with the power of Congress to grant exclusive rights to patentees to make and sell their inventions, and an encroachment upon the rights which the patent assures to the patentees. We agree that if this is the case the ordinance can have no such application. The power of Congress to grant the exclusive right to make and sell the articles which from their or iginality and value have

will be set on fire by the concussion and take on the form of ing become so great, the monopolists willingly paid ings of others, and he must obey all other regulations of police which are made for general observance. (Patterson vs. From 1791 to 1798 all tax was removed. Then the plan of Kentucky, 97 U.S., 501.) Invidious regulations applicable tion of that nature here. We have no doubt that it was be taken as established by the concurring practice of civilized States. They are a class of persons who travel from place to place among strangers, and the business may easily be made a pretence or a convenience to those whose real purpose is theft or fraud. The requirement of a license gives opportunity for inquiry into antecedents and character, and the payment of a fee affords some evidence that the business is not a mere pretence.

Judgment affirmed.

#### Electric Launches.

At the recent meeting of the British Association, Mr. A. take the whole of a patented invention to constitute an in- Reckenzaun read a paper "On Electric Launches." He described the boat Electricity. It has one Siemens D<sub>2</sub> dynamo connected directly to the screw shaft, upon which is a propeller with two blades; diameter 1734 inches, pitch Where a defendant has repudiated a license formerly held 111% inches, and area of blade surface 66 square inches. has been sent to the Vienna Exhibition. This is 40 feet long An interesting question came up on this trial relative to by 6 feet beam, and can carry forty passengers. The motor is a Siemens  $D_2$  machine, which develops 7 horse power with 80 cells, and a current of 40 amperes. The screw is twobladed of thin forged steel, with a diameter of 19 inches, and a pitch of 13 inches. The weight of the motor and batteries combined is 214 tons. During the trial the speed of the boat was over eight miles an hour, the current used at the time being 41.22 amperes, and the counter electromotive force 112.5 volts, with 60 cells in circuit.

> Mr. J. Clark, of Glasgow, described a wooden boat, clinker built, 21 feet long over all by 4 feet 4 inches beam, and drawing 12 inches of water with three or four persons on board. She is fitted with an electric motor coupled direct to the propeller shaft, and her power is derived from two battery boxes 3 feet long by 8 inches wide, and 12 inches high, which can be utilized as seats. The batteries require recharging with chemicals about every four hours of continuous use, one battery driving the boat at three-quarters speed, while the other is being recharged. During several trials at Kilcreggan-on-Clyde, a speed of a little over five miles an hour was obtained, the motor running at 600 revolutions per minute. The weight of the boat complete, with batteries charged, is 4 cwt. Clark's electric launches are now being built by Messrs. Gilbert Bogle and Co., of Glasgow, of varying sizes, from 15 feet long and four miles per hour speed to 30 feet long and seven miles per hour speed. The author gave no clew as to the nature of his batteries or to the cost of working them.

> Sir William Siemens said that there were many applications in which the secondary battery would be most useful, but it was a mistake to suppose it could be employed for every purpose. For instance, it was foolish to endeavor to adopt them for driving tricycles, but in launches, where the machinery was perforce very cramped, they promised excellent results. The great question was whether the secondary battery would last or whether it would perish. In order to test this point quietly he had put down batteries in his own house last autumn, and he had found them satisfactory so far. He charged them all day, and at night he used both them and a small dynamo to feed his lamps. In the case of a launch the machine could not be taken with the boat, and consequently the navigation would be confined to short stages.

> Sir James Douglas pointed out that an electric launch was much more easily swung from the davits of a ship than a steam launch, and that it offered greater security at sea. There was no fire to be put out if two or three waves were shipped, and the machinery would work under water. There