

Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT

No. 361 BROADWAY, NEW YORK.

O. D. MUNN.

A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

One copy, one year, for the U. S. or Canada, \$3 00
One copy, six months, for the U. S. or Canada, 1 50
One copy, one year, to any foreign country...

Australia and New Zealand.—Those who desire to receive the SCIENTIFIC AMERICAN, for a little over one year, may remit £1 in current Colonial bank notes.

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

The Scientific American Supplement

is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly. Every number contains 16 octavo pages, uniform in size with SCIENTIFIC AMERICAN.

Terms for Supplement, \$5.00 a year, for U. S. and Canada. \$6.00 a year to foreign countries belonging to the Postal Union.

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

Australia and New Zealand.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for a little over one year on receipt of £2 current Colonial bank notes.

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

Scientific American Export Edition.

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

NEW YORK, SATURDAY, OCTOBER 15, 1887.

Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as Army, British, standing; Ash sifter, improved; Balloon views of the polar regions; Battery, secondary, new; Beetles that kill trees; Books and publications; Boxes, packing, machines for; Bread, French, how made; Business and personal; College of Physicians and Surgeons, new building, dedication; Copper and iron, Lake Superior; Cutter head, improved; Earth over salt mines, subsidence of; Engine, soda, the; Exhibition, International, at Glasgow; Gas process, a new; Gear, variable expansion; Inventions, agricultural; Inventions, engineering; Inventions, index of; Inventions, miscellaneous; Iron or steel, to free; Knowledge, definiteness in; Law, very queer; Lucigen, the; Magnets, action of, on liquids; Manuring cannot be overdone; Memorial, Henry Draper.

TABLE OF CONTENTS OF SCIENTIFIC AMERICAN SUPPLEMENT No. 615.

For the Week Ending October 15, 1887. Price 10 cents. For sale by all newsdealers.

Table listing scientific articles such as I. ANTHROPOLOGY.—The Ba-Yanzi.—Vivid description of this tribe of African savages.—Their human sacrifices.—The tombs of their chiefs.—The general customs.—2 illustrations. 9827
II. BOTANY.—A Plant Heliostat.—By BYRON D. HALSTED.—A Californian plant whose leaves always turn toward the sun.—Investigation of this curious habit.—Renanthera Lowii.—An interesting and beautiful flowering plant illustrated.—1 illustration. 9830
III. ELECTRICITY.—Improved Electric Pendulum.—A new and ingenious pendulum with magnetic escapement.—3 illustrations. 9826
The Mix and Genet Microphone.—A new German transmitter for telephone service.—2 illustrations. 9826
IV. ENGINEERING.—A New Arrangement of Hydraulic Main.—Leclair's new main with Alavoine's strainers.—A new invention in gas engineering.—1 illustration. 9822
Large and Small Locomotives.—A thirty-nine and a three-ton locomotive compared.—Their relative dimensions and gauges.—2 illustrations. 9819
Petroleum Fuel.—The problem of burning petroleum on locomotives.—Experience with it in Russia and on the Pennsylvania road in this country.—The Comparative Value of Steam and Hot Water for Transmitting Heat and Power.—A paper read by CHARLES E. EMERY before the Am. Soc. Mech. Engineers.—An elaborate discussion of this subject. 9817
V. HYGIENE AND PATHOLOGY.—A Patient's Account of the Pasteur Treatment.—The success of Pasteur's treatment and weakness of his adversaries' arguments.—Color Blindness among Railroad Employees.—By WILLIAM THOMPSON, M.D.—Results of the tests in use by the Pennsylvania line, and their adoption by the Philadelphia and Reading road. 9829
VI. METALLURGY.—"Rapid" Open Hearth Steel Plant.—Thwait's combination of pneumatic and open hearth process.—3 illustrations. 9821
VII. MISCELLANEOUS.—A New Helicograph.—By THOMAS H. BLAKESLEY, M.A.C.E.—A new signaling apparatus, that can be attached to an opera glass.—1 illustration. 9826
The International Yacht Race.—The races between the Volunteer and Thistle.—The plans of the vessels.—4 illustrations. 9825
The Japanese Magic Mirror.—By Dr. R. F. HITCHCOCK.—Two Japanese curios described.—The burning crystal ball and magic mirror.—1 illustration. 9826
VIII. NAVAL ENGINEERING.—New Floating Dock.—A new English dry dock described and illustrated; its arrangements for taking on "listed" vessels.—2 illustrations. 9815
Ship Waves.—Report of an important lecture.—By Sir WILLIAM THOMPSON, recently delivered in Edinburgh; the forms and motions of waves.—3 illustrations. 9815
IX. ORDNANCE.—The New One Hundred and Ten Ton Gun.—The dimensions and sections of the great Elswick gun, the largest of Sir William Armstrong's productions.—6 illustrations. 9819
X. PHOTOGRAPHY.—On Red and Purple Chloride, Bromide, and Iodide of Silver.—On heliochromy and on the latent photographic image.—By M. CAREY LEA, Philadelphia.—First instalment of the famous papers by this leading photographer. 9822
Practical Photography.—A paper on the above subject by A. LONDR, of France.—5 illustrations. 9823
XI. PHYSICS.—Experiments on the Mechanical Equivalent of Heat on a Large Scale.—By E. A. COWPER and W. ANDERSON.—A British Association paper giving accounts of the experiments, apparatus, and results attained.—3 illustrations. 9825
The Velocity of Propagation of Flame.—By LEWIS T. WRIGHT, A.S.M.E.—Interesting experiments more directly addressed to the subject of the safety of the Davy lamp in coal mines. 9824
XII. TECHNOLOGY.—Apparatus for Testing Oils.—An ingenious registering apparatus for testing the quality of lubricating oils.—1 illustration. 9822
Sand for Glass.—By GEORGE WARDMAN.—American sources of supply for glass sand, its purity and appearance. 9822

RAILROAD MEN'S BUILDING.

The new Railroad Men's Building, erected in this city by Mr. Cornelius Vanderbilt, at a cost of \$100,000, as a gift to railroad employes, was formally opened on October 3, 1887, when it was turned over to the uses of the Railroad Branch of the Young Men's Christian Association. Speeches were made by the donor, Mr. Vanderbilt, and by several others. Then they were responded to in an address of acceptance by Mr. Elbert B. Monroe in behalf of the association to whom the building is specially dedicated. Bishop Potter was present, and created somewhat of a sensation by proposing three cheers for Mr. Vanderbilt. Mr. Chauncey Depew closed the proceedings by one of his characteristic addresses.

The building is situated on Madison Avenue near the Grand Central Depot. Within it contains all the appurtenances of a well-ordered club house—lecture room, bath rooms, reading room, lunch room, etc. Entertainments by prominent lecturers are to be given there throughout the season, and there is little doubt that much pleasure and profit will be derived by the railroad employes from this gift of the railroad magazine.

The building is to be accessible to all employes of roads using the Grand Central Depot. It is not exclusively in the possession of the Young Men's Christian Association. This point was made by Mr. Vanderbilt in his speech.

The building, of ornate style in brick and terra cotta, is two stories high. The roof is of glazed Spanish Akron tiles. The gymnasium and bowling alley are fitted up with the latest improvements. The bath rooms include a plunge bath, 6 feet deep and 9 1/2 by 13 1/2 feet in area. In the basement all the partitions are of marble, with bronze framework. Brass pipes are used for the plumbing. In the library is a collection of 6,400 volumes of general and miscellaneous reading. In the reading room 100 newspapers are kept on file. The lecture hall is 36 by 66 feet in area, and can seat 400 people. It is finished in oak, cherry, and ash. The building is wired and piped for electricity and gas. The architects were Robertson & Potter, of this city.

For a nominal charge any of the railroad employes on the specified lines has full use of the privileges, and after being in good standing for a year becomes a life member.

EXHIBITION OF TRAIN TELEGRAPHY.

An interesting exhibition of train telegraphy was given by the Consolidated Railway Telegraph Company, of this city on the 6th instant. A special train of six cars was run from Jersey City to Easton, carrying the apparatus for transmitting and receiving. The train contained the guests of the Consolidated Company, and the party was the outcome of an invitation extended by Mr. Charles A. Cheever, the president of the company, to the New York Electric Club. The trip occupied about five hours. During the running of the train, the operator was kept busy sending and receiving messages. Although the speed of the train was no relation to the practical working of the system, yet a greater measure of public approval looked for from the fact that the cars were running at a speed, exceeding sometimes sixty miles an hour.

The method is a simplification in the Edison system, already very full. The tin roofs of the cars are used as condensers that is charged and discharged of a "buzzer" many hundred times a minute. One leaf of a condenser is wire strung on low poles nearly as possible at an even distance. The rapid charges and discharges are reproduced upon the line through these with a key, and reduced on the car, as in the Edison system, by means of phones are used. The head against the tin roof of the car seats, and the easiness with which the apparatus is noticed rapidly.

The apparatus consists of the "buzzer," transmitting key, and induction coil. The core of the latter is the magnet of the "buzzer." These are secured to a small lap board. For battery, twelve chromic acid cells (Bunsen type) are used. A compact form of these has been adopted, and is carried in a hand case. The whole equipment for a car is carried by one man, the operator himself, and can be attached and put in working order and transmit messages or receive them in a few minutes.

* See SCIENTIFIC AMERICAN, Vol. 54, No. 8.

The great advance over the old Edison method consists in the use of a single line wire instead of a number of parallel lines. The reduction of the quantity of apparatus and its portability are also notable.

Many well-known scientists and electricians were on the train; among others, Thos. A. Edison, Prof. Barker, Messrs. Pope, Gilliland, Phelps, Van der Weyde, and others. The opportunity was taken for sending and receiving many congratulatory messages.

MAGAZINE RIFLES.

The merits and defects of the various types of magazine guns are just now attracting much attention in the European military press. L'Avenir Militaire makes serious charges against the efficiency of the German magazine gun, with which the German infantry have been supplied, and the Militar Wochenblatt replies with similar charges against the French arm. The one charge and the other do not differ essentially; neither the German soldier, with the new "Mauser," nor the Frenchman with the "Lebel," have yet got the "hang" of the magazine rifle, which, being far more complicated than the old arm, requires more careful handling. That novices at such mechanisms should be awkward is scarcely surprising, and the observer at the butts, however friendly, would see little to praise in their target practice. That skill as well as experience is required to get the real value of the magazine gun has been clearly demonstrated during the last few months; and an excellent proof that the new arm is not altogether satisfactory is to be found in the German and French military journals, which, while indignantly denying the truth of the assertions made by hostile critics, seem unable to bring forward any facts or figures to aid them. Thus the Deutsche Heeres Zeitung, just at present much wrought up over the published observations of a correspondent of the Swiss journal Gazette Suisse, contents itself with denying in general terms the truth of his statements, and makes no attempt to go specifically into the charges. It says that the new arm has been shown, beyond peradventure, to be at least quite as efficient as any other type known; that it is simple in construction, strong in parts, accurate in fire, and in the hands of the German soldier, accustomed to handling the old Zundnadelgewehr, of which this is only an improvement, is more effective than any other. Yet the Swiss correspondent, who witnessed the work of a part of the 25th corps at the butts, only corroborates other military observers when he declares that men draughted from the farming districts of Bavaria, Wurtemberg, and especially the Pomeranians, Westphalians, and West Prussians, cannot, because of the great size of their fingers, operate the mechanism of the Mauser magazine gun with nicety, dispatch, or safety to the parts; and that in such unskillful hands the advantages of a quick-firer are lost and its defects made more prominent.

Again, like others, and in the same way, the "extractor" shell and worked by their fingers. The consequence of the piece, and as the cartridges are not certain, because

the "Lebel," with which, when armed, it has some defects as the Mauser being quicker and more accurate in mechanism, the equation of the piece is less, as are also the improvements in this arm. General Tramind, commander of St. Cyr, are very important arm now in use, is of eight inches diameter, made of steel, are fired by a breech-loader, which is smokeless, of tremendous force, gives little or no recoil, and, it is said, the discharge is so slight that it can be fired at a distance of twenty-five yards. The cartridges are much smaller than that now in use, as is the case with the ridge, yet the trajectory is almost straight, being hit at long range 95 times out of a 100 by those at all accustomed to arms of any kind. In some respects this new piece resembles the Lee-Burton invented Pralon rifle, but in its mechanism it eradicated the defects which that was seen to possess.

Recent experiences of the English with the repeating rifle have been peculiarly unsatisfactory. The Broad Arrow, quoting the Times of India, says that the exhaustive trials at Bengal have proved that both the Lee-Burton and the improved Lee are altogether unsatisfactory. It says:

"That there should be many who object to the new rifle on the grounds of the waste of ammunition involved is only natural, and to be expected, but to find the weapon itself breaking down in its strongest point, viz, rapidity of fire, is astonishing, but not incomprehensible. The report says that the improved Lee is the better of the two, but that when any large number

of rounds have to be fired, the Martini-Henry is quicker than either. The term 'repeating rifle' is really misleading to the non-military public, and the name 'magazine rifle' is far more accurate. Many people seem to imagine that the repeating rifles fire continuously like a revolver, up to a certain number of shots, by merely pulling the trigger; but this is far from being the case. Each cartridge has to be extracted, and the breech closed as in the case of a single loader, the only time saved being that employed in taking a fresh cartridge out of the pouch and placing it in the chamber, while, when the magazine is emptied, it is necessary to refill it, cartridge by cartridge, thus wasting as much time as is occupied in loading the same number of cartridges direct into the chamber. The addition of a fixed magazine must of necessity make the rifle clumsy and awkward to handle, while it must either make the balance unequal or depend solely on a spring for its action."

How French Bread is Made.

One summer's day we stopped to call at the stone farm house of Monsieur Duval. Ernestine, the eldest daughter, was housekeeper in her dead mother's place, and she it was who brought out the amber-colored cider, the goat's cheese, and the heavy, hard, country bread. It is an essential of French peasant hospitality to offer these things to visitors.

The loaf she took from the shelf was one of half a dozen leaning against the black wall. These loaves resembled cart wheels, and had been baked in six-quart milk pans. Ernestine cut the loaf with a small saw made for the purpose! Nothing less than such a saw, or a pirate's cutlass, could sever that homely but wholesome *pain rassis*.

These loaves, we knew, were baked only once a month. Bread day in a Norman peasant family is like washing day on an American farm, in the respect that it comes at regular periods. We judged that bread day in this cottage was approaching, from the fact that only six loaves remained of the original thirty or thereabout.

After our luncheon Ernestine took us through the orchard to a picturesque stone building, where the bread was wont to be made. This building had once been part of an ancient abbey, and amid its ivy-covered ruins we could still trace fine sculpture and bits of armorial designs, but inside there was no trace of art or architecture. It was really a Norman hen house. We saw several pairs of *sabots* or wooden shoes hanging from the wall and looking as if they had been whitewashed.

In one corner of the place was a large space inclosed with boards. This was empty, but, like the *sabots*, it suggested whitewash or mortar making.

Ernestine told us that this was the family dough trough. Hither, once a month, came her father and the hired man to "set" the yeast a-rising. Flour and water were stirred together with the huge wooden spades shaped like our snow shovels which hung with the *sabots* upon the wall. When the mass, thoroughly beaten together, had risen and assumed a dark color and leathery consistency, then came the tug of war. The two men put on the *sabots* over their ordinary shoes, jumped in upon the dough, and began the kneading. Their way was to hop and prance and flourish like opera dancers, to stamp and kick like horses, exerting themselves till the perspiration streamed off them and they had no strength left. After this process the dough was put into the pans, and then baked in the huge oven at the rear of the abbatial hen house.

In all Norman towns half-clad men may often be seen lounging about bake house doors. Their legs and feet are bare and floury, and as they tread the streets we know that they have just come from or are returning to their usual occupation of kneading bread.

"*Mon Dieu!*" exclaimed Ernestine when we told her that in America bread making was woman's work. "*Mon Dieu!* how cruel your men are! I would rather shoe horses!"—*Epoch*.

Great Pumps.

The Lawrence Machine Company, Lawrence, Mass., have been awarded the contract for one of the largest pumping plants ever planned in America. The plant is for the city of Montreal, and consists of four centrifugal pumps, each with a discharging opening of 24 inches diameter, and capable of handling 18,000 gallons of water per minute, and four similar pumps of 15 inches discharge opening, and a capacity of 7,000 gallons per minute. Thus the four 24 inch pumps have a combined capacity of 72,000 gallons per minute, 4,320,000 gallons per hour, 103,680,000 gallons, or 386,000 tons, of water per day of twenty-four hours; and the four 15 inch have a combined capacity of 28,000 gallons per minute, or 1,680,000 gallons per hour. These pumps are contracted for by the Inundation Committee of Montreal, and are designed to pump the sewage of the city over the walls and dikes now in process of erection to protect the lower portions of the city from the annual inundation caused by the floods and ice gorges of the St. Lawrence River.

PHOTOGRAPHIC NOTES.

Instantaneous Photographs Made at Night.—With rapid plates of the present time, no trouble is found in taking instantaneous photographs by day light, but doing such work at night is something quite new. Messrs. Goedicke and Miethe, of Germany, recently succeeded in producing a flash of light of surpassing brilliancy and actinic force, by mixing an explosive compound of magnesium powder, chloride of potash, and sulphide of antimony.

Experiments show this compound to be rather dangerous, requiring especial care in its handling.

Quite recently, Dr. H. G. Piffard, of this city, a member of the Society of Amateur Photographers, carried on a series of experiments with a view of overcoming the dangerous qualities of the potash and magnesium compounds, and finally ascertained that a similar light of great power could be easily made by mixing with seven grains of gun cotton from fourteen to twenty grains of magnesium powder. There is no danger connected with this light. The gun cotton flashes instantly, as soon as ignited, and combines with the magnesium to produce an intense actinic light. The lens is used with full aperture, while the light is placed about ten feet from the object.

We were shown a negative made with this light which was quite remarkable for the density of the image and the detail exhibited in the dark portions of the object. Of course a plate of high sensitiveness had to be employed.

One of the Causes of the Fading of Photographs.—The *Photographic News* finds that salts of iron in cardboard mounts have a deleterious effect on the photograph. It says: Iron, in one form or another, is present in every sample of dark-colored or buff card which we have examined, and it is with respect to the darker colored cards that we have received the bulk of complaints. In the case of some of these mounts, the iron is so loosely held that water alone will extract enough to strike a blue color with ferrocyanide of potassium; but in other instances the iron is not extractable by water alone, but readily comes into solution if a portion of the mount is treated with water containing a little hydrochloric acid.

The body of the buff-colored mount is generally made, for the sake of cheapness, of a pulp containing iron, this metal usually being in an insoluble state in the case of the individual sheets of which the card is built up; but in the process of mounting these sheets, the elements necessary to produce soluble iron compounds are introduced, as the paste or cement used almost invariably contains an appreciable portion of common salt (chloride of sodium), and, if not acid when used, generally becomes so before the sheets of cardboard are dry.

In such a case, the soluble and highly mischievous perchloride of iron is formed, and either makes the prints fade all over or works through holes in the enamel coating, and produces the spotted appearance so familiar to professional photographers. If the starch, paste, and gum for mounting the photograph become sour, the iron will be transformed into a harmful salt.

Testing for Iron.—A mount may be tested for iron in the soluble state by first making an infusion, that is, cutting up portions of the mount and soaking in warm water. If a few drops of a cyanide of potassium solution be added, a blue color should at once appear, provided any iron is present. A soluble iron compound may be considered in all cases as injurious.

To test for iron in an insoluble state, but in such a condition as to readily become soluble, pour fresh water on other pieces of the same mount, and for each drachm of water add two drops of pure hydrochloric acid, allow the whole to soak for an hour or two, and then filter off and test with ferrocyanide of potassium, as before. Iron in the condition indicated by this test may become soluble and mischievous, if the photographs are allowed to remain in a damp place, as then the paste used in making the card will probably become acid.

Very Queer Law.

If a decision just made by the Supreme Court of Connecticut is sound law, real estate on the banks of rivers with a tendency to change the course of their channels is a dangerous investment for capital. The court holds that rivers are natural boundaries, and when they alter their course their functions as boundaries are not affected by their former relation to lands. That no mistake may be made interpreting the meaning of the court, the decision gives a forcible illustration of a possible result from the waywardness of the river. "If," the decision says, "after washing away the intervening lot, it should encroach upon the remoter lots, and should then begin to change its movement in the other direction, gradually restoring what it had taken from the intervening lot, the whole, by law of accretion, would belong to the remoter, but now approximate, lot." Under this statement of the law an owner on the river front is not only liable to see his property gradually disappear under his own eyes, but if it reappears subsequently it belongs, not to him, but to his fortunate next-door neighbor.

Oil from Grape Seeds.

In Italy oil is now made from grape seed. According to the *Revue Francaise*, the following is the method employed. On being removed from the wine press the marc is well dried, the seeds are separated by a fan, and afterward subjected to a cleaning process.

When perfectly clean and well dried, they are ground like wheat. The finer the flour thus obtained the greater the yield of oil. The milling requires some attention as regards the arrangement of the millstones. As soon as the first product is withdrawn, it is bolted; that which is left on the bolting cloth is again ground, and so on, care being taken to add a little water to the flour as it passes between the stones. The product from the mills is then thrown into boilers. If ten kilogrammes, for example, are to be treated, in the middle of the mass, and into a hole extending to the bottom of the vessel, three liters of water are poured. The vessel is then placed over a slow fire; the flour little by little is stirred with the hand or with a spatula, to mix it well and to prevent the formation of lumps, and it is left over the fire until the hand cannot bear the heat of the mixture. This operation is very important. The better regulated the cooking of the flour, the greater is the quantity of oil obtained. The flour, still hot, is placed in wrappers, and is taken to the press and treated like other oil-producing seeds. After the first pressure the mass is broken down by hand and pressed a second time. One hundred kilogrammes of well-ripened grapes give from ten to twelve kilogrammes of oil.

Sulphurous Fumigations.

The Havre Congress of Hygiene have agreed to publish a set of directions for disinfecting, for the benefit of doctors or masters of infected vessels. Brimstone, broken up in small pieces, should be placed in broad and shallow earthenware or cast iron dishes, of about 1 liter capacity. The vessels should be of one piece, without solder, and, as a precaution against fire, should be placed in tubs holding 2 or 3 in. of water. To light the brimstone, either sprinkle it with a little alcohol or tip it with a little cotton wadding dipped in the same liquid. For each cubic meter of room, 30 grammes of sulphur are requisite, or about 1 oz. for each 40 cubic feet, all the openings being kept tightly closed for twenty-four hours. How to proceed when a large space is to be disinfected, and how to open the doors after fumigating, are described in detail, but one of the characteristic cautions given by the wise men at Havre is to avoid as much as possible, on board steamers, to let sulphur fumes get into the engine room—not that serious harm is to be apprehended, but because the vapors turn polished brass and steel an ugly red color, which greatly displeases the engineers.

The British Standing Army.

The "General Annual Return of the British Army" for the year 1886 has just been presented to Parliament. On the 1st of December, 1886, the composition of the *personnel* of the army was as follow:

Officers.....	7,204	
Warrant officers.....	687	
Sergeants and farriers.....	12,756	N. C. O.'s and men 200,672.
Buglers, etc.....	3,376	
Rank and file.....	184,540	
Total.....	208,563	

The nationalities of the non-commissioned officers and men of the army were as follows:

English.....	146,171
Scotch.....	16,446
Irish.....	32,153
Various.....	3,487

Oxychloride of Zinc Cement.

This cement or mastic is prepared by mixing 1 part of the finest pulverized glass with 3 parts of oxide of zinc thoroughly calcined (made from the carbonate), which is afterward kept in well-stoppered glass vials. Separately 1 part of borax is dissolved in the smallest possible quantity of water, it is mixed with a solution of chloride of zinc of 1.5-1.6 sp. gr., and is kept in this state in well closed vials. To use this mastic, enough of the powder is mixed with some of the liquid to form a putty, which hardens readily until like stone. Under the name of Paris dental cement a similar preparation is sold in the pharmacies which has even been used for filling hollow teeth. This composition can serve excellently for many other purposes; for example, to attach to each other different parts of technical, scientific, or domestic appliances, where a tenacious, quickly hardening cement is required.—*L'Electricita*.

AN ingenious plan to save a dying pear tree was adopted in the garden of L. M. Chase, of Boston. The mice had girdled the tree so that it seemed bound to die. Mr. Chase planted four small trees around it, and close to it, cut off the tops, pointed the ends, and, making incisions in the bark of the pear, bent the small trees, and grafted them upon the dying trunk. They all lived, and that tree draws its nourishment from the small ones. This season a bushel of handsome pears were taken from it.