Communications.

Hydraulic Cement, Stone, etc.

To the Editor of the Scientific American:

Hydraulic limestone consists of common lime, with an admixture of clay and sand, often interspersed with small particles of iron and mica. Where hydraulic limestone cannot be obtained, take the following composition: 3 parts fine unslacked lime, and 2 parts potter's or strong joint clay or slimy loam. If the clay contain iron and mica, all the better. This composition must go through the water process, or what is commonly termed washed, so that the particles of lime and those of the clay will become amalgamated, forming hydraulic matter. The solution must then be sifted through a thin horsehair sieve, sufficiently coarse to admit of the fine particles of sand passing through with the solution into the evaporating pan. The water being evaporated will leave the hydraulic matter in a soft plastic condition, which can either be cut up into chunks or moulded into bricks or blocks in the usual manner. These burnt at a high pitch of fusing heat, in a kiln or furnace built expressly for fusing the great portion of the material, for about 36 or 40 hours, will when ground fine, the finer the better, form an hydraulic cement equal in every respect to the best Portland, in some respects even preferable, inasmuch as it can be manufactured so that it will immediately set in water when newly mixed, which the Portland cement will not admit of.

For making hydraulic stone for building purposes, take 1 part cement, 2 parts fine, clean, sharp sand. For paving blocks, tiles, etc., say 6x6x2, 9x9x2, and 12x12x2, take 1 part cement, 1 fine sand, 1 coarse sand, pass through ¼ sieve. For bricks, take 1 part cement, 2 parts fine, clean, sharp sand. These must be pressed. Blocks moulded. Roofing, paving and the like require to be pressed.

Austin, Texas. DIMELOW LABORATORY.

Pumping with Tight Connections.

To the Editor of the Scientific American:

In your issue of August 4, J. R. Smyth gives some experimental data in regard to pumping with tight connections, but gives no data bearing upon the subject of my query in your issue of June 9, as he admits having bored two holes only 100 feet apart, one of which would operate as a vent for the other. The case to which I referred is that of a well 1,200 feet deep, cased with tubing to a depth of 735 feet, there being no other well of similar character nearer than 16 miles. An attempt was made by the local engineers to pump with tight connections which utterly failed, as did also the attempt for about 12 hours hard labor by the foreman of a large establishment in Chicago, from whom the machinery was purchased, but as soon as the suction pipe was placed inside the tubing, there was not the least hesitation in taking water.

Morrison, Ill. E. W. PAYNE.

A Reminiscence of Nail Making.

To the Editor of the Scientific American:

I notice your article on "nail making" in the last number of the SCIENTIFIC AMERICAN. You do not make a distinction between the nail made with or without heads. I believe up to about 1816 nails were cut and headed by hand in two operations. I think it was about 1816 (not later) that Richard Reeve of this place invented the first known machine for cutting and heading the nail at one time. He sold the right to a Pittsburgh Company, he (Reeve) retaining the right of Ohio. He began the manufacture by horse power, the old-fashioned large cog wheel pulled around by the horse attached to a lever. About 1820 he and his brother George built a nail factory and a rolling mill for rolling their own nail iron. The iron made at or near the place did not prove a success for nail purposes, and they could not import iron from Pittsburgh and make the nails to compete with the Pittsburgh Company. After several years of struggle they had to succumb to competition.

Zanesville, O. A. C. R.

The Sea Monster.

To the Editor of the Scientific American:

In your issue of August 4, 1877, I saw an account of a sea monster given by Lieut. W. P. Haynes, of H.M.S. Osborne, and thinking it might be of interest to inform you that I have seen the above mentioned corresponding with the description given of the same. The head I did not see, as the sea was running very high at the time. I saw the same about mid ocean on my trip from Bremen to Baltimore in the year 1851, on board the ship Schiller.

Fredericksburg, Va. CHAS. F. BARLOSIUS.

A Wise Decision.

At a late meeting of the New York Board of Health, a communication was received from the Board of Police in respect to a proposition from a firm of disinfectant manufacturers to disinfect the garbage and street dirt, with a mixture of carbolic acid and copperas, at the place of final deposit, and requesting the opinion of the Board as to whether the garbage and street dirt so treated is suitable for filling purposes within the city limits. The Board decided that the disinfection of the material with the preparation referred to renders it less offensive, and that it may be safely used in the filling-in of bulkheads and docks; but it cannot, they say, be safely used in localities likely at any time to be occupied by dwellings or factories.

Architectural Science.—Questions and Replies.

Describe the meaning of "coarse stuff" and "fine stuff."—"Coarse stuff" is a rough mortar formed by mixing one or one and a half of sand to one of lime by measure, and about one pound of beast hair (which should be strong and free from grease or dirt) to every 3 or 4 superficial feet of mortar. Coarse stuff is put on the walls or ceilings to form the first coat, and is scored to form a key for the second coat. "Fine stuff" is pure lime slacked with a small quantity of water, and afterwards mixed to about the thickness of cream; the water is then allowed to evaporate until thick enough for use. A small quantity of white hair is sometimes mixed with it. It is used for the second or finishing coat, and should be applied when the coarse stuff is stiff.

In first rate work, what are the proper number of coats required for walls and ceilings?—Three, namely, 1st coat, coarse stuff; 2d coat, fine stuff; 3d coat, fine stuff mixed with a little hair if to be papered, or plasterer's putty mixed with sand if to be colored.

Describe the mode of finishing walls.—1. For paint.—Surfaces which are to be painted are finished with a coat of bastard stucco, consisting of ⅔ fine stuff and ⅓ fine sharp sand. 2. For paper.—The finishing coat is a kind of inferior fine stuff or stucco, mixed with hair to form a firmer coat. 3. Colored walls are properly washed with size before the application of the color. 4. Cement walls.—In some positions it is advisable to have a cement finishing coat to form a hard surface. It is essential that the cement coat be grounded out with cement, as it will not properly adhere to plaster. It is finished with the trowel, and when a pure white surface is required for marbling, Parian cement is used. 5. Tile walls.—Tiles, or thin squares of marble, etc., are used as dadoes, and are set and jointed in pure cement.

What is the best cement for internal walls left for decorations?—The Parian cement is the best for such purposes. It may be procured of two qualities, known as coarse and superfine. For an under coat the coarse quality may be used, with an equal quantity of fine sand, finishing with a thin coat of pure cement of the same quality on surfaces to be wholly covered with paint or paper; or with the superfine quality when to be tinted or polished. The superfine gives a pure white surface capable of taking a brilliant polish, and is rendered non-absorbent and washable. This cement may be tinted with any colors required—either mixed with the finishing coat—worked as scagliola, or, after the cement is applied to the wall surface, it sets sufficiently hard within 24 hours to admit of painting or papering. As no efflorescence is given off, the most delicate tints may be applied with safety. It is more economical to use Portland cement and sand as an under coat, or selenitic cement if quicker setting is required. Martin's and Keene's cements are also white and quick setting cements, and may be used for similar purposes as the Parian; but the latter is considered to be most easily worked. Johns & Co.'s cement may also be used as a finishing coat on common plaster, for surfaces to be painted, etc.

In designing cement or plaster cornices and ceilings, what principles should be observed?—The outline or profile of cornices should be designed so as to suit the apartments in which they are formed; the members must be proportioned so as to give the best gradations of light, according to the position of windows, keeping in view the friable nature of the materials to be employed, and avoiding thin edges with deep under-cuttings. The arrangement of mouldings in a cornice will be regulated by the relative height of various rooms, or the proportion that height bears to length and breadth of apartments. Where the ceiling appears too high for the size of the room, the apparent height may be diminished by forming the cornice chiefly on walls, or by introducing a coving springing from walls to ceiling, with any curve suitable. If the ceiling is low, apparent height may be obtained by forming a cornice with nice projections thrown chiefly on ceiling—a hollow being worked at junction of walls and ceiling so as to give a lighter appearance, and prevent excess of material at that point. Increased projections require to be supported by "dubbing out"—by driving in flat-headed nails—or by bracketing; or, what is more substantial, by corbelling out the brickwork approximately to the profile required. A section of the intended cornice may, with advantage, be tried in position, and the effect of adding enrichments, or the cutting-in with different colors noted, before a final selection is made. In designing ceilings the form and height of rooms will regulate the construction; when of a good height ceilings are best formed in panels. If arched or domed the panels should be arranged to accord with direction of rafters, etc. For flat ceilings the divisions formed by roof trusses, or by girder floors, with binders between, may be advantageously used, the laths or battens being fixed to fillets nailed to sides of same. Single floors with deep joists at intervals are also well adapted for such a construction. The projecting timbers may either be wrought or covered with wood casing or plaster, adding mouldings or enrichments as required. The main divisions of ceiling should range so as to come over the solid parts of walls and not over openings. On ordinary ceilings a "key" may be obtained for the required projections in forming panels, by using flat-headed nails or bracketing. The number, size and shape of panels formed will depend on the extent of surface to be covered and shape of room. The center panels—especially with coved ceilings—may be more deeply recessed than the others, and should be finished with a center piece. Deep recesses should not be given to panels when the ceiling is low, as the shadows formed tend to darken the room. In such positions the ceiling should be flat, or with slight projections formed in the plaster.

Give a specification for general plastering.—The internal plastering to be executed with well burnt chalk lime of good quality, well mixed with clean, sharp drift, or river sand, and strong hair. The laths to be strong laths and half laths, nailed at both ends with cast iron nails. Lath the partitions and ceilings, render the walls, and float, set, and finish for paper, and whiten the ceilings. Twice lime-white the walls of cellars and stairs leading to them, also outhouses. Run cornices to drawing, dining, and breakfast rooms, 12 inch girt, with one enrichment to each, 2½ inch girt, the cornice to principal entrance and hall to be 9 inch girt; and to the landings, bedrooms, and dressing rooms on first floor, put cornices 7 inch girt. The external work to be run, moulded, and finished in Portland cement of the best quality, in the proportion of 1 of cement to 3 of clean sharp sand.—*Building News.*

Lighting Factories by Electricity.

The application of electricity to the lighting of factories seems at last to be accomplished. For some time the magneto-electric machines of Gramme have been used in the lighting of certain factories in Paris and its neighborhood, and the number goes on increasing, and where the ceilings are lofty, and direct light applicable, the success is perfect. Among the establishments so lighted are those of MM. Cail and Cie., engineers; MM. Sautter, Lemonnier, and Cie., the makers of the Gramme machines, both of Paris; and MM. Thomas and Powell, of Rouen, and at the Fives-Lille Works.

This system of direct lighting, however, is quite inapplicable to weaving or spinning sheds, the ceilings of which are only a few feet from the floor; the light is much too intense, and everything which impedes it, and shafting driving bands, and machines, create intense black shadows.

The problem was to get a light which, like that of the sun, allows objects to be seen in shadow, and this has been achieved by throwing all the light, by means of a hyperbolic reflector, on the whitened ceilings and walls of the loft, and leaving the workpeople in the general shadow, which is sufficiently illuminated by reflection from the whitened walls and ceiling, and everything is seen as in shadow on a bright sunny day, the eye is not fatigued, nothing is painfully brilliant, and nothing obscure.

Our respected contemporary, *Le Moniteur des Fils et Tissus*, gives the particulars of cases which illustrate the system fairly though not fully. The wool-spinning factory of Madame Dieu-Obrey, at Daours, in the department of the Somme, covers an area of 473 square meters; it is a ground floor, 43 meters long, 11 meters wide, and the ceiling is 3.70 meters from the floor. This ceiling is but fairly even, being composed of planks, the joints covered by means of laths, and it and the walls are lime-washed. In the daytime the light enters by large windows, but at night these are covered with white blinds, which act as reflectors. The machinery consists of nine doubling and seventeen other machines, and fifty workmen are engaged. The machinery is arranged lengthwise, in several parallel lines. Most of the wool spun is colored, but a certain proportion of white serves to show the different effects.

The electric light is supplied by two lamps, placed at the height of two meters from the floor on round wooden platters, suspended from the ceiling by three iron rods, and the light is thrown upon the ceiling by means of conical reflectors, which prevent the diffusion of any direct light whatever. The deflected light is reflected and diffused in all directions from the ceiling and the walls, and without shadows.

This light is much superior to that given by ordinary gas; it is soft, and at once local and general in all parts of the works. The foreman seated at his desk has plenty of light for working at his books, and sees all over the building. Thus the grand intensity of electric light is at once utilized and moderated. The machinery is in a wooden press at one end of the factory, and is driven by a band from a water wheel. This mode of lighting has been in use here for more than a year; the cost of the motive power is almost *nil*; each lamp consumes from eight to nine centimeters of the carbon points per hour, and the cost of them being two francs per meter, consequently the cost for the two lamps is 34 centimes, less than 3½d., per hour. The seventy gas jets by which the same factory was formerly lighted cost 2fr. 10c. per hour.

MM. Richard fils, cotton spinners, light two floors with the electric light; the first floor is 33 meters long, by 21·20 meters wide, and contains ten spinning machines, is lighted by two electric lamps; the upper floor, at least a part of it measuring 16 meters by 21·20 meters, and containing five self-acting machines, is lighted by a single lamp. Both these have worked every night in the week since May, 1876.

MM. Buneda frères, wool spinners and weavers, have a shed 58 meters by 22, and containing 13 spinning frames, 12 carding, and various accessory machines, which is lighted by three electric lights; 80 people are employed in this factory.

Two other factories in which the light has been adopted are those of M. Ancel, at Fresse, in the Vosges, and the spinning mill of M. Meng, at Epinal.

Besides cheapness, the effect on colors is an important consideration, and it is found that with the electric light even the darkest colors are worked at night quite as easily as in the daytime. Another important consideration is that of fire; an electric lamp replaces from 50 to 70 jets of gas; they require no hand lamps or matches to light them—a most important consideration; and, lastly, the lamps are completely enclosed in glass lanterns. So important are these facts that several insurance offices, we are told, have offered to insure factories lighted by electricity at lower rates than usual.

The electric light requires no long preparations; the necessary machines and lamps can be set up in a few hours; all that is required is to keep the grease boxes of the machines full, and to clean the latter daily. The electric light does not affect the temperature of the factory, and consequently does not dry the air, and the fact of its not altering colors has caused it to be adopted by dyers, among whom are M. Gunydet pére and fils, of Roubaix, and MM. Hannart fréres, of Wasquehal.

The expense of the electric light is given as follows: The cost of a machine with lamp, giving light equal to 500 carcel jets, is about £92, and these will represent from 50 to 70 gas jets, according to circumstances. The power required is equal to two horse steam power, and the cost of the carbon points, as already stated, is 18 centimes per hour for each lamp. When the power is that of water the cost is inconsiderable, and when that of coal has to be taken into account for the steam engine, it amounts to 20 centimes per hour, bringing the total up to 38 centimes per hour, and lubrication is set down at about 2 centimes more, while the wear of the machine is regarded as *nil*. Taking for basis that an electric lamp only replaces the minimum number of gas jets, namely 50, it is seven times cheaper than gas, motive power not included, and four times cheaper, taking the cost of driving as estimated above. These facts compose a strong case, and the success which has been obtained is easily ascertained. A perfect light as regards colors, which neither injures the eyes of the workpeople, nor renders factories unhealthy, while immensely reducing the risk of fire, and which saves 75 per cent on the cost of gas lighting, is a desideratum which requires no recommendation.—*Textile Manufacturer*.

How Cable Telegraph Lines are Worked—Electrical Induction.

In overland lines the current traverses the wire suddenly, like a bullet, and at its full strength, so that if the current be sufficiently strong the instruments will be worked at once and no time will be lost. But it is quite different in submarine cables. There the current is slow and varying. It travels along the copper wire in the form of a wave or undulation, and is received feebly at first, then gradually rising to its maximum of strength, and finally dying away again as slowly as it rose. In the French Atlantic cable no current can be detected by the most delicate galvanoscope at America for the first tenth of a second after it has been put on at Brest; and it takes about half a second for the received current to reach its maximum value. This is owing to the phenomenon of induction, very important in submarine cables, but almost entirely absent in land lines. In submarine cables, as is well known, the copper wire which conveys the current is insulated from the sea water by an envelope, usually of gutta percha. Now, the electricity sent into this wire induces electricity of an opposite kind to itself in the sea water outside, and the attraction set up between these two kinds "holds back" the current in the wire and retards its passage to the receiving station. It follows that with a receiving instrument set to indicate a particular strength of current, the rate of signaling would be very slow on long cables compared to land lines; and that a different form of instrument is required for cable work. This fact stood greatly in the way of early cable enterprise, Sir William (then Professor) Thomson first solved the difficulty by his invention of the "mirror galvanometer," and rendered at the same time the first Atlantic Cable Company a commercial success. The merit of this receiving instrument is, that it indicates with extreme sensibility all the variations of the current in the cable, so that, instead of having to wait until each signal wave sent into the cable has traveled to the receiving end before sending another, a series of waves may be sent after each other in rapid succession. These waves encroaching upon each other, will coalesce at their bases; but if the crests remain separate the delicate decipherer at the other end will take cognizance of them and make them known to the eye as the distinct signals of the message. The mirror galvanometer is at once beautifully simple and exquisitely scientific. It consists of a very long fine coil of silk-covered copper wire, and in the heart of the coil, within a little air chamber, a small round mirror, having four tiny magnets cemented to its back, is hung, by a single fibre of floss silk no thicker than a spider's line. The mirror is of film glass silvered, the magnets of hair spring, and both together sometimes weigh only one tenth of a grain. A beam of light is thrown from a lamp upon the mirror and reflected by it upon a white screen or scale a few feet distant, where it forms a bright spot of light. When there is no current on the instrument, the spot of light remains stationary at the zero position on the screen; but the instant a current traverses the long wire of the coil, the suspended magnets twist themselves horizontally out of their former position, the mirror is of course inclined with them, and the beam of light is deflected along the screen to one side or the other, according to the nature of the current. If a positive current, that is to say a current from the copper pole of the battery, gives a deflection to the right of zero, a negative current, or a current from the zinc pole of the battery, will give a deflection to the left of zero, and *vice versa*. The air in the little chamber surrounding the mirror is compressed at will, so as to act like a cushion and "deaden" the movements of the mirror. The needle is thus prevented from idly swinging about at each deflection, and the separate signals are rendered abrupt and "dead beat," as it is called. At a receiving station the current coming in from the cable has simply to be passed through the coil of the "speaker" before it is sent into the ground, and the wandering light spot on the screen faithfully represents all its variations to the clerk, who, looking on, interprets these and cries out the messsage word by word. The small weight of the mirror and magnets which form the moving part of this instrument and the range to which the minute motions of the mirror can be magnified on the screen by the reflected beam of light, which acts as a long impalpable hand or pointer, render the mirror galvanometer marvelously sensitive to the current, especially when compared with other forms of receiving instruments. Messages have been sent from England to America through one Atlantic cable and back again to England through another, and there received on the mirror galvanometer, the electric current used being that from a toy battery made out of a lady's silver thimble, a grain of zinc, and a drop of acidulated water.—*Good Words*.

PRACTICAL MECHANISM.

BY JOSHUA ROSE.

NEW SERIES—No. XXXI.

PATTERN-MAKING.—WORM WHEELS.

A worm wheel is a spur wheel somewhat modified to suit the different conditions under which it has to work. The rim is made concave to suit the curvature of the worm; the teeth have also to be set at an angle corresponding to that of the thread. These modifications add much to the difficulty of constructing the pattern. The hollow curvature of the rim makes it necessary to have a pattern in halves, or at least the rim with the teeth must be so divided that the teeth must spring at a certain inclination. In consequence of these complications the spaces between the teeth of worm wheels are mostly cut from the solid metal by machinery.

The construction of the body of the wheel separate from the teeth is a comparatively easy matter, and has been made, we trust, sufficiently clear in the remarks upon the construction of pulleys and sheaves in halves, or with a divided rim. Having turned the body, let the two parts of which it is composed be held together temporarily by screws; pitch off the rim into the number of divisions required. We have now to consider the inclination it is proper to set the teeth at. It may be of some use at this point to reflect upon the conditions governing the working of a wheel in a worm. On account of the curvature of the wheel, its teeth, in traversing the worm, rise and fall and come into contact with all parts of the thread; but the angle of the thread changes according to its distance from the center, the obliquity being greater at the bottom of the thread than at the pitch line, where it is greater at the top of the thread. Therefore the teeth of the wheel, however well fitted, never find a sufficiently extended bearing upon the thread of a worm, and in consequence are rapidly worn away if the speed is great, or the duty heavy. It will now be seen that the best place to take the angle of the thread is at the pitch line, which may be readily done by placing the worm upon a flat surface and applying a bevel to the side of the thread at that part. This angle is drawn on the rim through the several divisions by fitting a piece of wood around it for a short distance, this piece to be cut of the required angle. The arrangement is fully shown in Fig. 219. Fit and glue the blocks to the rim at this angle, using the piece, A, as a guide, each tooth being formed of two pieces meeting at the center.

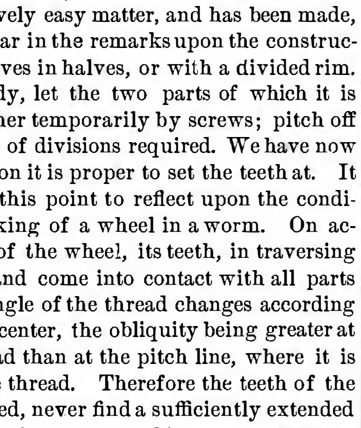

Fig. 219.

Place the wheel in the lathe and turn to the required shape, line off the teeth on both sides and across the top, and shape to a template. A cheaper kind of wheel is often used for light duty by making the rim straight instead of concave.

Ancient Mode of Embalming the Dead.

Herodotus and Diodorus tell of three modes of embalmment prevalent in Egypt. The first was very costly, answering to about $2,000, exclusive of such gems, jewels, and gold as love and prodigality might lavish upon the dead; the second, $300; the third within the reach of all. As to the extent to which gems and jewels were wound up in the cerecloth to deck the dead, there is the instance of the queen lately found at Thebes, whose ornaments were shown in our Exhibition of 1860. They are now in the Pasha's Museum. Their intrinsic value alone, that is, to break up and melt down, is several thousand pounds. It is curious in reading the two historians' accounts of the Egyptian embalmer to observe in divers matters the foreshadowing of the modern undertaker in his ways. The different degrees of woe were then as now sounded according to the depth of the purse. Just as it is now, when the furnisher will undertake for you any gradation of sorrow from the simple elm coffin and pauper funeral up to the flourish and parade of plumed hearse, weeping mutes and prancing steeds, so with the Egyptian. Only the manner was different. When a bereaved mourner, they tell us, went into one of these Egyptian shops, the functionaries would show him different models in wood highly and artistically finished, or otherwise, to represent the mummy and coffin. There were painted patterns of mummies in their multi-colored cases to choose from. The various costs, according to pattern, were then stated. The customer choose his model, and the bargain was struck. He then went home and sent back the dead body, and the body remained with the embalmer until the whole process was completed. The number of days requisite for embalming was, as we gather from both historians, seventy or seventy-two, and this tallies with the Scripture account (Gen. l. 3); for doubtless the immediate process only occupied part of the time, the rest being given to the ritual of mourning. The processes for embalming are related very categorically. In some things they hardly commend themselves to our present sentiment of what is respectful to the dead. The chief secret seemed to consist in certain chemicals injected into the veins and body; in certain washings and steepings in natron, and in the filling-up of the cavity of the body with myrrh and other balsamic substances and spices. The brains were drawn out through the nostrils. Sometimes the face and hands were gilt. Certain jewels were laid on the breast under innumerable swathings of linen. And then a kind of pictured shell received the body—a sort of close-fitting case made to open and shut lengthwise after the fashion of a violin case. But when the mummy was sent home—what then? The family did not immediately part with it. On the contrary, they often kept their dead relative for a long while, guest in his own house. A room was set apart. The mummy, standing upright as in life, was enshrined in a kind of painted cabinet—a tabernacle starred over with innumerable hieroglyphics, and protected with great painted scarabæi and multicolored cherubim, with their overshadowing wings spread athwart the chest. Hither, then, at intervals, the family would come to hold communion with the dead. They would bring fresh lotus flowers to enwreath their silent relative, or strew about the ground blossoms of asphodel and papyrus. Numberless paintings in the tombs of Egypt picture this affecting scene—a mother and her children kneeling in circle with the dead in their midst, or a wife with plaintive face and dishevelled hair embracing the placid-looking mummy of her husband. Listen to what Diodorus says: "A clever embalmer," he writes, "would send back the body perfectly preserved, even the hair of the eyelids and eyebrows remaining undisturbed; the whole appearance so unaltered that every feature might be recognized. The Egyptians, therefore, who sometimes keep their ancestors in magnificent apartments set apart, have an opportunity of contemplating the faces of those who died long before them, and the height and figure of their bodies being distinguishable, as well as the character of the countenance; they may enjoy a wonderful gratification, as if they lived in the society of those they see before them."—*Sunday at Home.*

Award of the Lavoisier Medal.

The Lavoisier medal of the Societé d'Encouragement pour l'Industrie Nationale has just been given to an Englishman, Mr. Walter Weldon, F.R.S.E. In presenting it M. Dumas congratulated Mr. Weldon upon having cheapened every sheet of paper and every yard of calico made in the world; and at the same meeting at which the presentation took place Professor Lamy stated that, whereas at the date of the introduction of Mr. Weldon's invention, seven or eight years ago, the total bleaching powder made in the world was only about 55,000 tons per annum—it is now over 150,000 tons per annum; and that of this vast quantity fully 90 per cent is made by the Weldon process. The Lavoisier Medal has been awarded only once before, namely, in 1870 to M. Henri Sainte-Claire Deville. The only other recipients of this Society's "Great Medal," which bears different effigies according to the class of service for which it is given, are Ferdinand de Lesseps, Boussingault, Jaques Siegfried, Henri Giffard, and Sir Charles Wheatstone.

Pivot Teeth in Dentistry.

Among the best of the inventions in the way of pivoting is a device of Dr. Bonwill's. The root being cut down, the pulp-canal is reamed out greatly in excess of the size of the pivot that is to occupy it. A pivot made of platinum wire, upon which a screw is cut, is next fitted into the canal, and firmly packed into place through the use of amalgam. When this amalgam is set, the tooth—the pivot hole running through it—is placed upon the pivot, and is screwed solidly into place by means of a delicate nut, made of gold. It will be understood, of course, that the fitting of the tooth in position has been done at the time of setting the pivot into the root. This operation, when well accomplished, holds a pivot tooth so firmly in place that it may be used with the utmost freedom in mastication.

THE authorities in charge of Fairmount Park, Philadelphia, have decided to use a portion of that domain for educational purposes, and have asked the co-operation of the Pennsylvania Horticultural Society. It is proposed to begin with the hardy perennial and Alpine plants, and form as complete a collection as is possible. Every character of soil and location is readily obtained, even for the aquatic plants.