Scientific Museum.

For the Scientific American.

Vegetable Sensibility.

The principle which disposes a plant to take cognizance of the different agents to which it may be exposed, has been termed irritability by some, sensibility, or sympathy, by others. The Cassia nictitans and chamæchrista are sensible to the touch, and always resent the rude and officious hand that presumes to meddle with them. If an insect touch the inner part of the stamens of the Barberry, it immediately strikes its author against the stigma. The leaves of the Dionæa muscipula are bordered with bristles, and secrete a fluid, of which insects are very fond. When any one happens to light upon the leaf it immediately springs together like a rat-trap; the bristly points locking into each other, squeeze the insect to death. The pistil of the Nigella, when perfect, inclines to the stamen until it becomes fecundated. The Kalmia presents similar powers. The Photomogeton is all under water except the flower; when the flower is in blossom the plant rises to the surface, its leaves float, suspending the fruit until it becomes perfect, then they all sink to the bottom. The staminate flower of the Valisneria is small and fast to the bottom of the water. The pistillate flower has a very long peduncle which is spiral; the flower floats on the waters.—When the water rises it untwists and rises with it. When the staminate plant becomes perfect, the peduncle rots off, the flower rises to the surface and floats upon it. The flower of the Colchicum autumnale is on the top of the plant, and blossoms late in the fall; but the seed is perfected in the root below the surface of the ground, and beyond the power of frost. Utricularia contains little bladders along its leaves; it manufactures a gas which fills these bladders; the plant thus becomes specifically lighter than the water, and floats upon the surface. The plant flowers and fecundates, after which the bladders wither and the plant sinks. The Hedysarum gyrans is always in motion, moving its leaves with astonishing industry. If it be stopped from its action, it instantly resumes it when at liberty, and redoubles its exertions, as if to regain what it had lost. The Onoclea sensibilis withers on being touched by the human hand, though the touch of other substances does not produce the same phenomenon. The leaves of the Populus tremuloides are almost always in motion. The leaf of the Drosera rotundifolia is armed with small hairs standing erect, each of which terminates in a gland, secreting a glutinous viscid matter. Whenever an insect alights upon the leaf or touches any of these glands, there is a shock communicated to the plant, and these glands throw out the gluey matter; the little globules roll together to the place where the insect is struggling, entangle him, clog his limbs, and death is his portion. The leaves and footstalks of the genus Mimosa, too delicate to withstand the rude gaze or endure the presence of any other being, droop, faint, and seemingly wither, and shrink from the approach or touch. A species of the Apocynum is noted for catching flies. The insect, in his search among the nectaries, is seized by the head or leg, and held fast. It seldom escapes; for the more he strives for liberty the tighter he is held. Some plants expand and others close their corols on the approach of light, and others present the same phenomena at the approach of darkness.

J. W. O.

Rise and Fall of Sap in Trees.—Soils.

Messrs. Editors:—Errors promulgated by a popular man should be combatted as well as popular errors. Professor Lindley's theory of the "rise and fall of sap in trees," in your paper of the 27th inst., may be true in many respects, but there are some facts in regard to the matter, which I cannot account for by it. If trees bleed only when the sap is descending, and that consequently, on the roots being expanded with heat and the top contracted with cold, why is it that maple trees will bleed freely early in the spring, when the ground is covered with snow, if the atmosphere is sufficiently warm. Or when the ground is bare or covered with snow, why is it that they will bleed much more freely on the side upon which the sun shines, than on the other where the difference in the heat of the roots can be of no consequence? Or why, after a severe frost, will the sap run as soon as one side of the tree gets moderately warm, before the roots can be materially affected. Theories must be based upon facts, not facts upon theories: therefore have I presented these facts in hopes of getting a theory to fit them.

There is also, in a subsequent number, a communication upon soils, not in accordance with facts. A soil in this section is called a heavy clay if it is peculiarly adhesive, sufficiently so to remain in lumps of the size of a half bushel, after plowing; such a soil I have analyzed and found it to contain 76 per cent. of silica and only about 5 of alumina; and, furthermore, pure porcelain clay contains about one-half silica combined with alumina.

S. K. F.

Le Roy, N. Y.

Lime Burning.

Fig. 1.

Lime is the oxide of a metal called calcium, and it is used for a thousand different purposes. As a cement for building it has been long known, and its uses appreciated. It should never be used for building in frosty weather, and to this subject we directed public attention, in the early part of our last volume.—Since that time our city authorities have wisely taken the hint, and have come to the conclusion to build no more sewers, except as works of real necessity, during the winter season.

As we have had a number of enquiries made respecting lime kilns, and the manner of burning it, we publish below four engravings descriptive of the same.

Fig. 2.

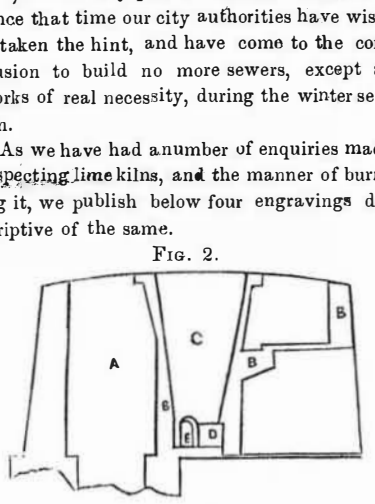

Fig. 1 represents an elevation of the usual formin which kilns to burn lime with coal are frequently built. A is the front wall of the kiln; B, part of a slope made to enable the workmen to mount up to the top of the kiln, to charge it with coal and lime-stone, in alternate beds. C one of the three arches that lead to the fire-room, and through which the lime is withdrawn.

Fig. 2 represents the section of the kiln. A the solid mass of the kiln; B linings of brick or stone; E the hollow cavity of the fire-room and chamber; D, mouth of the fire-room and ash-room; E two of the three arches that lead to the fire-room entrance.

Fig. 3.

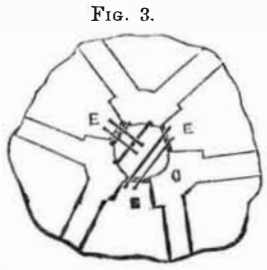

Fig. 3 represents the plan of the kiln. E the three arches leading to the fire-room; O iron bars placed across the bottom of the fire-room, to serve as a grate and supporter of the lime-stone.

Fig. 4 represents a section of a kiln for burning lime, by means of wood. E the main mass of the kiln; B the brick lining of the cavity where the fire and lime-stone are placed; C, the chamber fitted with line stone; D the fire-room. The workman, puts in a fagot to the mouth of the fire-room, and holds it there until it is perfectly alight, when he

Fig. 4.

drops it into the fire-room, and immediately stops up the fire-room door with another fagot and so keeps on: F, the arch-room, which is an arched vault that crosses the bottoms of the kiln; it has a hole in its middle which corresponds with the fire-room, and lets the small coal pass into the ash-vault.

The best form of the kiln is the egg shape and wood is preferred to coal in the burning. A lime kiln should always be built high, and the diameter according to the height. By burning chalk in a kiln, good lime is the result. After lime stone is burned it is much lighter than before, but it recovers its weight in a great measure when exposed to the air, as it absorbs carbonic acid therefrom. The burning of lime is anything but an agreeable or healthy business, but like many others it is very useful and necessary.

There is one thing curious about limestone, viz., if it be imperfectly burned in the first instance, and the stone cooled, no subsequent burning will make it into quick lime. In agriculture, lime is a great fertilizer, and as all marl is a species of lime, it would be all the better for being burned before it is used.

Method of Silvering Iron, as Practised by Major Jewreinoff.

The combination of iron with carbon (cast iron) from the ease with which it melts, and the consequent possibility of taking the finest impressions of form, has come into very extensive application. The art of founding converts cast iron into enormous arches, columns, cannons, and also into the most delicate bracelets, ear-rings, &c. Unfortunately the moist atmosphere very soon alters the surface of these objects, and it is found necessary to coat them with paint, which gives the cast iron, the color of which is itself not very attractive, the appearance of mourning. In the present state of the art of founding, cast iron might easily be substituted for bronze, were it not for its sombre appearance, which entirely excludes it. This disadvantage may, however, be entirely overcome, from the possibility of plating it with silver; in fact, cast iron may be readily silvered, and equally as well as copper and bronze. Some successful experiments which Major Jewreinoff, of St. Petersburg, had made on this subject induced him to give a short description of the method which he had employed. The liquid for silvering is prepared in the following manner:—Cyanide of potassium prepared according to Liebig's method, is introduced into a stoppered vessel, and freshly-prepared pure chloride of silver, still in a moist state, added; the whole being covered with water, and shaken violently for some time, at the ordinary temperature. An excess of chloride of silver is taken, and should a small quantity of it remain undissolved, a few pieces more of the cyanide are added after sometime, taking care, however, to avoid having an excess of the latter salt, but always a small quantity of undissolved chloride at the bottom of the vessel. This last circumstance is important, because when the liquor contains too much free cyanide of potassium, it is easily decomposed, and moreover does not silver so well. Before employing it, it is filtered, and is thus rendered perfectly clear; iron and a little chloride of silver remaining on the filter. He effects the plating by means of a galvanic battery of one pair, consisting of a zinc and a coke cylinder, which are separated from each other by means of an earthen diaphragm. The pair are placed in a glass vessel and dilute nitric acid is conveyed into the earthen diaphragm. Experience has shown that the best mixture for the coke cylinders should consist of five parts, by weight, of finely pulverized coal, and two parts common rye flour.—When the cylinders are dry they are placed in earthen crucibles, in the lids of which there is an aperture for the escape of the gases, and are then heated to redness. Those cast-iron objects may be most easily silvered which have not been painted, as the removal of the paint from the surface of the metal is somewhat difficult. The cleansed object is immersed in the silver solution, and connected with the zinc pole by means of a conducting wire, and a platinum plate immersed in the liquid at some distance from the object to be silvered, and connected with the coke cylinder. A plate of cast iron, of four square inches surface, is generally completely plated in half an hour.

LITERARY NOTICES.

The Scalpel.—The November number of this sterling journal has made its appearance, filled with able and intensely interesting articles, and although a thoroughly medical publication, technicalities are entirely avoided, and the most humble capacity can at once understand the subject discusses in its columns. The "Pathology of a Lady of Fashion," is an article of uncommon interest, and we regret that this number, especially, of the "Scalpel," cannot reach every family in the country: it contains sound articles upon contagious and infectious diseases; the effect of tobacco on virility; the causes of stricture, and the causes and treatment of dysentery, and how it differs from diarrhœa. There can be no doubt of the success of a journal of such merit, when conducted by an M. D. of Dr. Dixon's ability. Each number is sold for the low price of 25 cts., and all orders from the country will be promptly filled, by enclosing that amount in a letter (*p. p.*) to box 3121, New York city.

American Union.—This very excellent and ably edited literary newspaper, published by B. B. Fitts & Co., Boston, Mass., entered last week upon its third volume. Geo. P. Burnham, Esq., the Editor, is well known as one of the first writers in the country.—Terms $2 per annum.

The Water Cure Journal and Herald of Reforms, for November, is now ready, with a valuable contents. Fowlers & Wells, Publishers, 131 Nassau st., N. Y.

We are sorry to miss from our table the monthly visits of Mr. Simond's Pictorial National Library.