

**A New Autographic Process.**

In the Belgian *Bulletin du Musée*, M. Hannot describes the following new autographic process. The writing or drawing is made upon any kind of paper, which should, however, not be very thick. A special ink is used, composed of gum arabic or gelatine  $\frac{3}{4}$  ozs., water saturated with bichromate of potash 1 quart, and sufficient Indian ink to color the whole. The gum is first dissolved in the solution and the ink afterwards added. The preparation must be kept sheltered from the light, and when used a portion should be poured out in an inkstand of black glass. When the drawing is finished it is exposed to light, whereby the lines are rendered insoluble.

A plate of zinc or a stone is then prepared and polished with emery, and the drawing is placed upon it face downward. Above the latter is laid a sheet of paper covered with gum arabic, and above this two or three sheets of dampened blotting paper. The whole is then pressed. The moisture in the blotting paper reaches the gummed paper, and the gum, dissolved, traverses the autographic paper and affects the zinc or stone everywhere except where the insoluble lines of the design have prevented its passage. A roller of greasy ink may then be passed over the plate, and the grease will adhere only to the lines which are not covered with moisture. Printing is then done in the usual way.

**Phosphorescence of Quinine.**

If some sulphate of quinine is strewn over a sheet of smooth paper and exposed to a heat of from 120° to 140° Fahr., by means of a plate of metal, it becomes phosphorescent when stirred with a glass rod. Valerate of quinine exhibits the same phenomenon without heat being applied, if the crystals are rubbed in a mortar. It is said that the appearance is only noticed when the valerate contains an acid prepared directly from the root of valerian.

**IMPROVED BORING MACHINE.**

Machinery of some sort for boring is almost indispensable in all wood-working establishments, and some of the contrivances in every-day use for that purpose are no longer economical in view of the improvements now made in this as well as the other branches of wood-working machinery.

The boring machine illustrated herewith is one of several sizes and styles built by Walker Brothers, Philadelphia, and is a heavy and substantial, yet easy working machine, designed for straight and angle boring of all kinds, the spindle carrying bits up to 2 or more inches in diameter, and having a capacity for boring to the depth of 12 inches.

The frame or standard is a coned casting in one piece, having a broad base, and is quite firm and rigid throughout. The work remains stationary upon the table, which may be adjusted to the proper height or angle, and the bit is brought down and fed through by the foot of the operator on the lever or treadle below. This treadle is provided with a stop to regulate the depth of cut, and with the upward stop the travel of the spindle may be regulated for thick or thin stuff.

The spindle is balanced by means of the adjustable weight on the lever above, and will return when the pressure of the foot is removed. The table is provided with two adjustments for angle boring, and a gage that may be removed when not in use, the whole being raised and lowered by simply turning the hand wheel underneath.

The proper range of speed is given for large or small bits by means of cone pulleys, and the countershaft may be set so as to run the belt from any direction and not interfere with parts of the machine.

This boring machine is furnished when desired with a full set of auger bits, including a small universal chuck for holding all kinds of straight shank bits or drills. For further information address the manufacturers, Messrs. Walker Brothers, Nos. 73 and 75 Laurel St., Philadelphia, Pa.

**Preparation of Celluloid.**

Paper is treated by a continuous process with 5 parts of sulphuric acid and 2 of nitric acid, which converts it into a sort of gun cotton. The excess of acid is removed by pressure, followed up by washing with abundance of water. The paste when thus washed, drained, and partially dried, is ground in a mill, mixed with camphor, ground again, strongly pressed, dried under a hydraulic press between leaves of blotting paper, cut, bruised, laminated, and compressed again in a special apparatus suitably heated. It is said to be hard, tough, transparent, fusible, becoming plastic and malleable at 125°. It ignites with difficulty, is decomposed suddenly at 140° without inflammation, and gives rise to reddish fumes. It is inodorous, and does not become electric on friction.—*English Mechanic.*

**IMPROVED LABEL HOLDER.**

The invention herewith illustrated is particularly intended for use in sending butter, eggs, fruit, or other articles by return package or crate.

Attached to the box or crate is the card holder, A, made of sheet metal or other suitable material, in the shape of an

Fig. 1

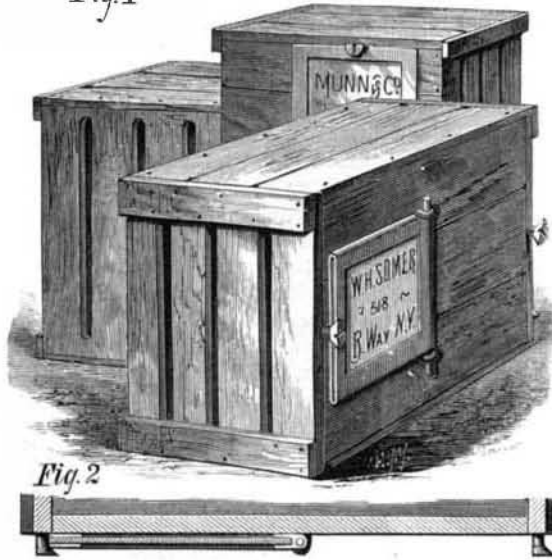


Fig. 2



open frame, the frame being grooved in such a manner that a card may be slipped into it from the outer end.

At the inner end of the holder are pins projecting at top and bottom; or a wire may be fastened in the inner end of the frame, and its ends project to form such pins. These pins are held to the box or crate by means of staples driven into the same over said pins, thus hinging the card holder to the box in such a manner that the holder may be turned with either side outward, and it is held by means of half-headed

screws or hooks. The card of any house to which the box or crate is to be shipped may be inserted in the holder, and on the obverse side of the card the return address is written. All the consignee has to do when he desires to return the package is to turn the screw or hook on one side, reverse the holder, and fasten it by the screw or hook on the other side. For further information, address W. H. Somers & Co., Hume, Alleghany County, N. Y.

**Dr. Isidor Walz.**

Isidor Walz, Ph.D., died in New York city on October 25. He was born in Bavaria May 5, 1846. He emigrated to the United States in 1859, and graduated at Columbia College in 1864. He studied chemistry under Bunsen and Erlenmeyer at Heidelberg, and received the degree of Ph.D. in 1867. He practiced his profession in this city, and in 1870 became editor of the *Manufacturers' Review and Industrial Record*. He conducted this paper with marked ability until October, 1876, when his declining health caused him to undertake a trip to Europe. Last month on his homeward journey he contracted the disease, pneumonia, which terminated his life.

**Recent Investigations on Hydrophobia.**

Hydrophobia has of late been extraordinarily prevalent in London. Hardly a day passes, says the *Lancet*, without some fresh cases being recorded, and the attention of the medical profession has been closely directed to the nature of this most terrible disease. The data thus far gathered are valuable, not so much as establishing new facts, but in corroborating and shedding more light on some which have hitherto received little notice. From the conclusions now reached it appears that a sharp distinction is drawn between mental hydrophobia and the genuine disease. An adult, when bitten by a dog supposed to be rabid, passes through a period of intense mental perturbation, suffering all the agonies of doubt, apprehension, and foreboding. These mental disturbances induce symptoms closely resembling those of the genuine disease. The manifestations of hydrophobia in man are perversions of the nervous centers, and disturbances of the reflex center and highest psychological organs.

The former is tolerably uniform, the latter extremely variable. In one case reported by the *Lancet*, there was little mental disturbance, very slight wandering at the close, and none of the wild paroxysmal furor which is commonly so conspicuous and so terrible a feature of the disease. In another case the psychical disturbance was so predominant that the patient was taken to an asylum as a simple lunatic.

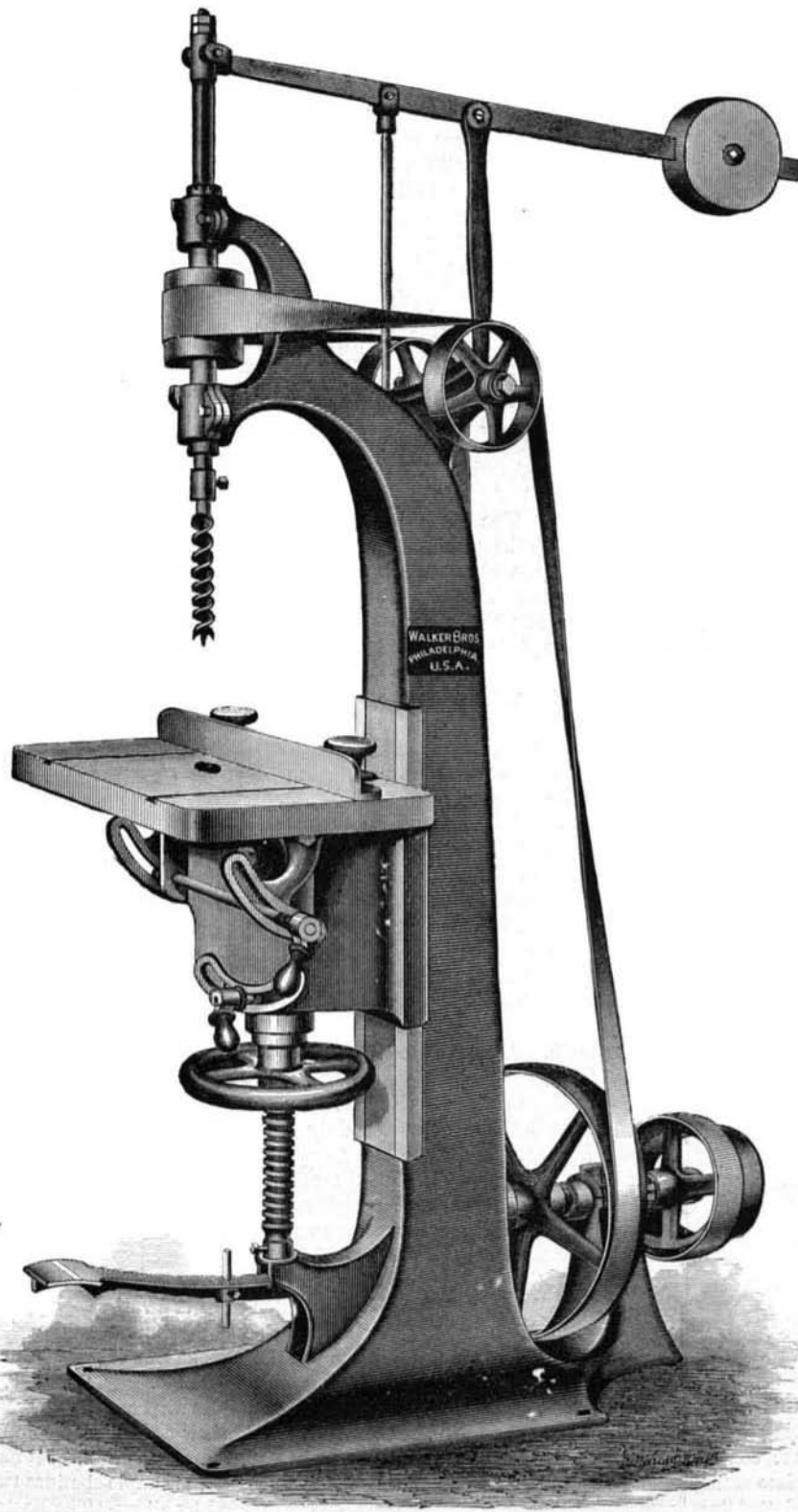
The symptoms of true rabies are not always alike. Its approach may generally be detected by some alteration in the manner and habit of the tainted animal. In some, which are naturally bright and lively, unusual dullness, whilst in others, which are of the opposite disposition, unnatural vivacity are occasionally the premonitory symptoms. There is a remarkable variation in the period of incubation. The disease may be latent in the system for as long as three years. This accounts for the outbreak of the disease in apparently healthy dogs. The popular idea that a person once bitten has a peculiar liability of developing the disease at intervals of seven years after the occurrence is sheer nonsense. Three years seems to be the longest period of incubation known.

The "respiratory spasm" is a conspicuous feature in every case. It is compared by one to the "hurried or intermitting gasping one sees in a child attempting to drink when sudden thirst has been induced by recent violent exertion," and by another to the inspiratory spasms witnessed "when a cold shower-bath is administered to an individual." It is excited not only by an attempt to drink liquids, but also by mental impression, and the sight of water, or sound of running water, will bring it on.

**Underground Telegraphs.**

Between Berlin and Halle an underground telegraph wire has been in use for one year, and underground wires are about to be laid between Berlin and the cities of Cologne, Frankfurt, Strasbourg, Breslau, Hamburg, Kiel, and Königsberg, thereby dispensing with posts and insulators, and avoiding the cost of their maintenance. The copper wires which convey the electric current are enclosed in wrought iron pipes, and are hermetically enclosed by insulating material, which protects them from the action of air and water, and prevents oxidation.

A CHEAP vinegar consists of 25 gallons of warm rain water with 4 gallons of molasses and 1 gallon of yeast. The mixture can be used after it has been allowed to ferment.

**WALKER BROS.' VERTICAL BORING MACHINE.**

**Coloring Zinc Roofs.**

Among recent German inventions is a simple process, depending on the use of acetate of lead, by which every kind of color is applicable to sheets of zinc. By mixing black-lead, for instance, with the salt, a very agreeable light brown hue is obtained. It is by this process that the cupola of the synagogue at Nuremberg has been painted. A sufficient length of time has already elapsed, it is said, to show that the atmosphere had no influence on the zinc sheeting of the roof, thus showing the practical value of the process in such cases. By the addition of other coloring matters light or dark shades of yellow or gray may be produced.—*English Mechanic.*

**THE NEW FRENCH EXPOSITION PALACE.**

The annexed engravings afford an excellent idea of the magnificent palace which has been erected in Paris for the Exposition of 1878. The palace stands on the summit of the hill, and its terraces look down not only on the Exhibition and the Champ de Mars opposite, but over the greater part of the city. The palace extends along the whole width of the Trocadéro, nearly 1,300 feet. It consists of a grand Central Hall, the axis of which coincides with that of the Exhibition, and of two wings, which, spreading east and west from the vestibule behind the hall, extend in a curve for a distance of 650 feet on each side. It contains one large theater of a horseshoe form, measuring 164 feet in one direction and 230 feet in the other. It will accommodate 7,000 persons, and will be fitted up with private boxes and the various tiers of seats necessary for public accommodation. The main entrance will not be from the Trocadéro grounds, but from the other side on the Place du Trocadéro. The entrance will consist of a large vestibule wider than the hall itself, and extending on both sides into spacious ante-chambers, which enclose the hall itself, as far as the stage in the latter. These chambers lead into the two wings before spoken of, and the axes of which intersect the back of the hall just to the rear of the stage, while the tower which terminates each wing stands forward 285 feet from that axis, so that the hall is thrown comparatively far back, partly subdued by the extended and advanced wings, but by reason of its great height and striking architectural features the most prominent characteristic of the palace. The wings contain a covered gallery 42 feet wide, and in front an open promenade about 18 feet wide, the roof of which is carried by elaborately carved stone columns. Similar terraces or

**A CURIOUS RESULT OF DENUDATION.**

In a paper on the volcanoes of the Haute Loire and the Ardèche, in the *Popular Science Review*, Rev. W. S. Symonds refers to an isolated rock, some 30 feet high, of twisted basaltic columns resting on granite which he found in the villages of Antraiques. This rock, an engraving of which is



herewith given, is a most remarkable monument of denuding powers of atmospheric influences: as it is evident that the basalt had flowed into a fissure in the granite, and that the granite walls have since been denuded. It is rarely that a more striking example of the rapid changes which are being made on the earth's surface by the slow action of atmospheric causes has been presented. The red color of the planet Mars has been ascribed to this same agency, it being suggested that red sandstone has resisted the denudation better than other geological formations, and hence gives its

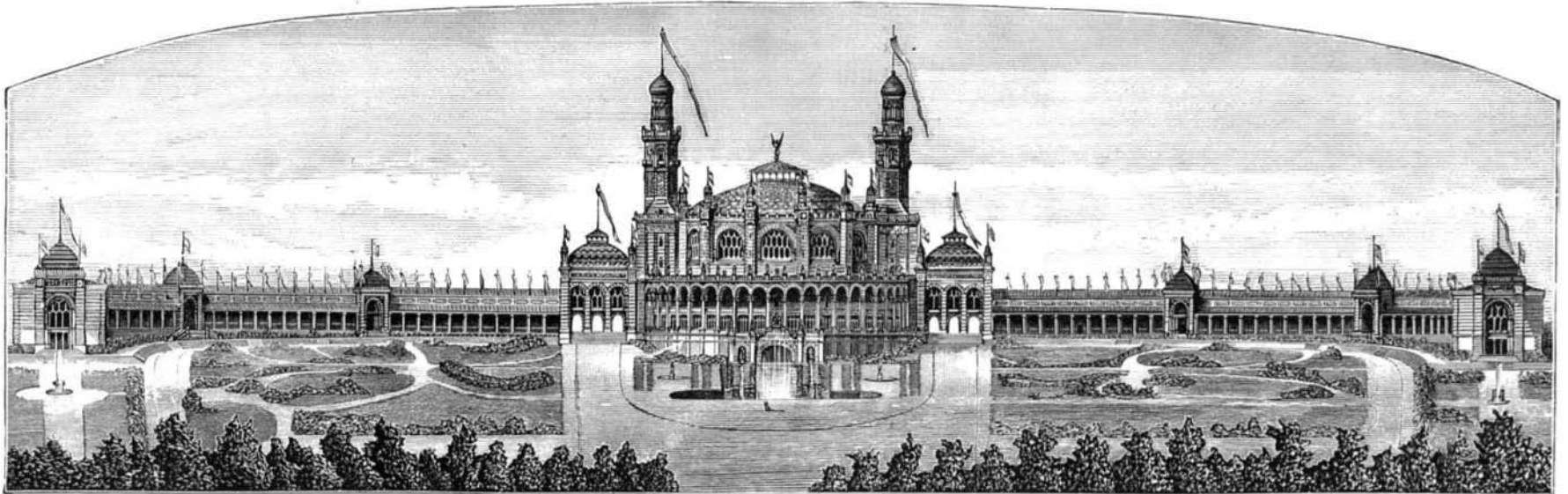
that the two observers communicate their results obtained at either extremity by electricity, and they are also in electric communication with the place where the commander of the battery is. In the one instrument, that of Garlt, the electricity merely communicates by telegraphic signs the angles obtained. In the other, constructed by Siemens and Halske, the electric current transmits automatically, by an instrument situated at one point, the angle measured by the altitude at the other. But the latter, though made with great precision, is liable to grave errors, and though much more rapid than that of Garlt, is less liked.—*English Mechanic.*

**Medical Harmony.**

A late number of the *Lancet* contains an article on the healing of difference between the old allopathic and new homeopathic schools, which is significant of a great change in medical opinion and the possible future fusion of the two schools. After briefly reviewing the origin of the homeopathic schism, and the subsequent warfare, the writer, Dr. Richardson, F.R.S., says that many of the allopathic physicians have renounced all the heresies of the past in the treatment of acute diseases; while homeopathic physicians have, on their side, almost entirely abandoned the use of globules, and have substituted doses in tangible form, their rule being to give a dose sufficiently large to effect its purpose, but not so large as to discomfort the patient. Both schools now use alike anodynes, aperients, opiates, anesthetics, tonics, galvanism, hydropathy, Turkish bath, and mineral waters. In short, he says, we define our practice as rational medicine, including the application of the law of contraries, but plus the application of the law of similars.

**Parisian Copying Ink.**

The best kinds of copying inks are, as is well known, prepared by adding a percentage of alum, sugar, and glycerin, or salt, to the extract of logwood. Such inks have a violet tint, and gradually become blacker on paper. The copy is, however, very pale at first, and is often indistinct. The Parisian copying ink is distinguished from the common kinds by its appearance more or less yellow in a liquid state, and by producing a distinct bluish-black on paper. It has the additional advantage of preserving its fluidity, while the common kinds soon thicken. Professor Gintl recommends the following method of preparing an ink which has all the advantages of the Parisian: A strong solution of log-



**THE FRENCH EXPOSITION BUILDING FOR 1878.**

colonnades surround the Central Hall on its Trocadéro front, and rise tier above tier to the upper gallery of the building. The two wings terminate in vestibules, thrown forward as already stated, and reached from the Trocadéro by flights of steps, for the difference between the ground level where the vestibules are placed, and the floor of the palace, is about 26 feet. The wings form approximately a semi ellipse, each being struck from four different radii. It is intended that this structure shall remain as a permanent monument of the Exhibition of 1878. We are indebted to *Engineering* for the engravings.

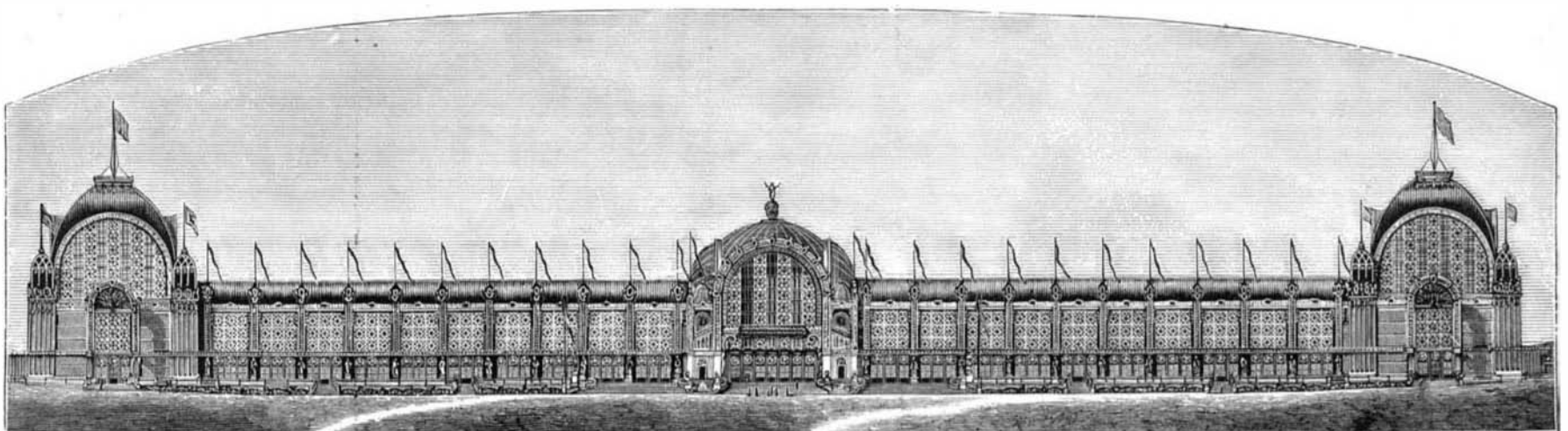
color to the general planetary surface. The rock represented in our illustration is locally known as the "Pain de Fromage," or "Cheese Loaf."

**New Telemeters.**

According to an Austrian paper, two new systems of telemeters have recently come into use in German coast batteries. They are based, like all others, on the principle of measuring a base line and of angles at the base, in order to determine, with the aid of tables, the height of the triangle. Without giving details of construction, it is simply stated

wood extract is treated with 1 per cent of alum, and then with as much lime water, so that a permanent precipitate is formed. Some drops of weak chloride of lime are then added, so that a perceptible bluish-black color is attained, and hydrochloric acid is added by drops till a red solution is obtained. A little gum is then added, with 0.5 per cent of glycerin.—*English Mechanic.*

IN Yucatan and Honduras musk is extracted from alligators. Their fat is used for oil, and their skin for shoe leather.



**THE FRENCH EXPOSITION BUILDING FOR 1878.**