

proaching session, an increase will be authorized, and that the selection of cadets will be limited exclusively to those States which, cooperating cordially with the government, have brought their forces into the field to aid in the maintenance of its authority.

French Purple.

[Translated from Dingler's Polytechnic Journal.]

Pourpre française, or French purple, is the name given by Messrs. Quinon, Marras & Bonnet, the well-known silk dyers in Lyons, France, to a violet pigment produced by them from lichens, such as *Lecanora tartarea*, *Rocella tinctoria*, &c. This pigment, in accordance with its origin and nature, closely resembles the dye known as litmus or orchil. It differs materially from it, however, in two particulars; first, by its much greater ability to be fixed on fabrics, particularly silk and wool, without the use of mordants, and to produce a genuine and durable color; and second, from the fact that its violet hue is changed to red only by pretty strong acids, whereas orchil turns red by the action of weak acids.

The process of manufacturing this dye comprises, first, the preparation of the material from which the dye is obtained and which is composed principally of lecanoric, erythric and orsellesic acid, &c.; second, the conversion of this material into dye by the action of ammonia, air and heat; and, third, the preparation of the dye in a solid state.

The several acids of the lichens can be extracted by means of alcohol, hot acetic acid, a mixture of alcohol and ammonia, or any other alkali. If ammonia is used, it is diluted with four or five times its volume of water, and a systematic extraction is effected by exposing parcels of the lichens which have already been extracted, to a greater or smaller extent, and finally, fresh lichens to the action of the same quantity of liquid ammonia, whereby the liquid is completely saturated with acid. The extract is afterward mixed with a surplus of sulphuric or muriatic acid, whereby the acids of the lichens are precipitated, and then collected on a filter and carefully washed and dried. The acids of the lichens can also be extracted by heating the plants with milk of lime and precipitating them with muriatic acid; or the lichens may be boiled in dilute sulphuric acid and afterward washed with water. In this case the acids remain in combination with the woody parts of the lichens.

The precipitate obtained by either one of the above methods is now mixed with sufficient ammonia to dissolve it, and this mixture is boiled, whereby a liquid is obtained the color of which soon turns to an orange, and which, if exposed to the atmospheric air at a temperature of from 60° to 70°, soon changes in the desired manner by assuming different colors, one after the other, until at last it becomes a bright red. While in this condition the liquid is put into flat vessels and gradually heated to from 120° to 140°. After a few days the liquid assumes a purple violet color, and is not affected by weak acids, and it will dye silk and wool without the aid of other substances; it can also be easily fixed on cotton by suitable mordants. If, instead of the acids, the lichens themselves, purified by being treated with diluted acid, are employed, the proceeding is substantially the same until the red color is formed, and after this the liquid is separated from the fibrous parts by the aid of a press.

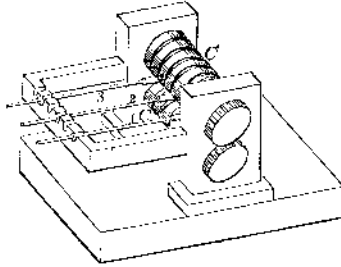
As soon as the acids of the lichens have been converted into the dye, the liquids from which the acids have been obtained are mixed together and saturated with sulphuric or some other acid. By this operation a copious precipitate is obtained which is collected on a filter and carefully washed and dried.

Instead of precipitating the red ammoniac liquid with sulphuric acid, as stated above, chloride of calcium may be used, whereby a precipitate is obtained having the appearance of indigo with a violet color. In this condition it is brought to the market.

[We have had a small sample of this substance in our possession for about two years. It was brought over here by a French chemist who endeavored to introduce it among our dyers. The color is a deep rich purple, somewhat resembling the section of a cube of Bengal indigo, when rubbed with the finger-nail. Its use, we understand, has lately been almost superseded in France by new aniline colors.—Eds.]

ROLLING GUN BARRELS.

The accompanying figure illustrates an improved method of rolling gun barrels and drawing them with a taper over graduated mandrels. C C represent two grooved rollers placed one above the other, and 1 2 3 are graduated mandrels passing between the rollers in the grooves. Three short cylinders of heated iron to be rolled into gun barrels are placed upon the mandrels, and the rollers draw down these cylinders by several passes between them into barrels of the requisite size and form. By this operation the barrels are not only reduced in diameter and in the size of



the bore, but they are tapered externally at the same time, and rolled into the perfect shape of the army service musket without receiving the stroke of a hammer.

The inventor of this improvement is James Henry Burton, formerly of Harper's Ferry Armory, also Superintendent at the Enfield Armory, England, and who is now said to be in the service of the secessionists, at Richmond, Va. Patented March 20, 1860.

How to Select Mushrooms.

In consequence of the death of five officers, caused by eating poisonous fungi, the French Army Board have had the following instructions published:—

Fungi afford man an agreeable and nourishing food and therefore in some provinces of France, they are consumed to a great extent. The soldiers seek them, but unfortunately they often confound the poisonous with edible ones, and thus expose themselves to the gravest accidents. It is important, therefore, that they should be taught, as far as science is able, to distinguish the wholesome from the injurious species, and at the same time be made acquainted with the proper means to combat the poison. It is with this view that the Board of Health have drawn out the present instruction. Edible fungi grow usually in elevated and airy places in waste ground; whilst the dangerous species are found in woods, and in dark damp places. The edible species have a compact, brittle flesh; while those with a soft and watery flesh should always be rejected.

Wholesome fungi have an agreeable odor, although this character is also found in some injurious species. A powerful and disagreeable odor is the certain indication of noxious qualities.

We ought at once to reject fungi which secrete a milky juice, and those which present an acrid, astringent, bitter acid or salt taste.

We should suspect fungi which have a bright tint, red, green, or blue, of which the gills are colored brown or blue. The flesh of the edible species is in general white; nevertheless, a beautiful red fungus, the *orange agaric*, is considered as the finest and most delicate species. Wholesome fungi do not change color by contact with the air after being cut; those of which the flesh then acquires a brown, green, or blue tint, are poisonous. We ought to regard as dangerous those which insects will not touch.

It is proper to abstain from fungi, whatever may be their apparent qualities, when they exhibit any signs of change; when even they have been collected more than twenty four hours—the poisonous properties being capable of development when the fungus dries up.

CURE FOR TOOTHACHE.—A patent has just been taken out in England, by M. A. Prenslan for curing toothache by what he terms "oil paper liquid." This is obtained by submitting paper to destructive distillation in a retort. The liquid comes over, and is condensed in the worm of the still, and then applied to the tooth with a pellet of cotton. The liquid thus obtained is nothing more than *creosote*, which is now used by many persons for allaying the pain of ulcerated teeth. Crude coal oil possesses the same properties, and may be used for the same purpose.

Action of Poison on Wild Animals.

The following is from B. R. Ross, in the *Canadian Naturalist*:—For the purpose of poisoning them strychnia is used. I have tried aconitine, atropine, and corrosive sublimate without success. The two former may not have been pure enough, though I obtained them from the first chemical works in England and at a very high price. The only poison that I have found strong is strychnia. One or two grains of this are mixed with a little tallow, forming a small ball, and covered with a coating of grease outside to prevent the animal from tasting it. A quantity of pounded dried meat and morsels are strewn about so that the animal after swallowing the poison may be detained a sufficient time for it to operate. The distances which animals go before they die vary greatly; in some instances they fall directly in others they run several miles with the same dose, and arranged in like manner. This I attribute to several causes; to their fatness, and to the quantity of food in their stomachs, as lean and hungry foxes die much more quickly than others. The medium in which the poison is given also causes a great difference. When put up in fresh meat a very long time elapses before it operates. Wishing to preserve a specimen of the Hare-Indian dog for the Smithsonian Institution, I resolved to kill the animal by poisoning. Two grains of strychnia of the first strength were administered in a piece of fresh meat; at the end of two hours the animal was as well as ever. I then administered one grain more mixed with grease, in two minutes the spasms began, and in five the animal was dead. The first symptoms were a restlessness and contraction of the pupil of the eye, and a flow of saliva from the mouth, violent cramps then ensued, the head shook violently, like a paralytic person, the legs were drawn up and the spine took a circular shape, a lull of a few seconds then ensued, when after an attack of great violence the animal died. On dissection the blood vessels of the head and neck were found very full of black and clotted blood, such as I have seen in the jugular vein of a person who had died of apoplexy. There was no inflammation of the stomach, and the fatal bait was found in the throat entire. Once seen, the symptoms of poisoning by strychnia are easily recognized, and I would be certain now of passing a correct opinion on a case of the kind. Dogs take a longer time to expire than either wolves or foxes; the latter dying most quickly; in fact according to the ratio of the wild nature of the animal who eats it will be the quickness and violence of its death.

Counterfeiting Rare Coins and Medals.

The Philadelphia Press states that "it has recently been discovered that numerous persons are engaged in the business of counterfeiting old and rare coins and medals, which are highly prized and sell at enormous prices. The coins are so accurately executed that it requires the best of judges to distinguish them from the genuine. A case has come to our notice, where a manufacturer of these relics realized over \$15,000 at an expense of about \$200. The subject has lately been brought before the Numismatic Society, of this city—a society for the collection and preservation of old coins and medals—and they have determined to denounce all persons who make, issue, or deal in such counterfeit pieces, and to use all legally proper efforts to expose them, and prevent the continuance of this fraudulent usage."

Counterfeiters either alter known coins, or strike new ones, or split the old specimens, and rejoin the halves which do not belong to each other. American colonial coins, and rare pieces, are manufactured very skillfully in New York, and nothing is more common than to find rare dates on coins carefully altered from common years. The electrotype process, of course, is a great aid in this species of fraud. The prices of coins and medals have varied, as the taste of collectors has been directed more toward one or another series or class. Very rare ancient gold and silver pieces have been sold by auction for prices as high as \$1,500, when the intrinsic value of the metal was about \$100. The Washington half dollars of 1792 have been sold for \$57, and the same piece in copper for \$64. Cents of 1793 and 1799 have been sold for \$10 and \$15, and half dollars of 1796 and 1797 for \$25. Collectors generally prize fine and uncirculated pieces, even of common dates, at higher rates than poor pieces of rare dates.