

USEFUL INFORMATION.

NEW CONCLUSIONS—THE PHOTOPHONE.—The opinion is gaining ground, especially among French savants, that the musical sounds produced by Prof. Bell in disks of various substances, such as mica, India rubber, metal and wood, by holding them in the path of a rapidly interrupted beam of light, are really due to heat and not to light. Radiophonic notes, such is the new term, have been obtained by M. Mercadier from ordinary gas lamps without employing lenses to concentrate the interrupted beam, by simply bringing the receiving disk near the source. Even a plate of copper heated to a bright red heat produced very distinct musical tones, which gradually died away as the plate cooled to a dull red followed by obscurity. The fact that when the receiving disks were coated with silver on the side next to the light the effects were feeble, and that when coated with absorbent lampblack they were strong, would seem to tell against Prof. Bell's conclusion that the sounds were due to light. It is a curious fact that when the radiometer was first brought out by Dr. Crookes he intimated his belief that its rotation was due to the impact of light waves; but heat is now known to be the cause of the motion.

SMALL PULLEYS AND SHORT BELTS.—Pulleys that are too small form a serious defect often found in our manufactories, and these are especially detrimental where double belts are used, because the double belt will not lead to so small a curve as a single belt will, hence there is less contact with the double. Small friction wheels, or belt-tightening wheels, again waste the power, running too fast, and therefore involving extra wear and friction. Short belts, especially vertical ones, are very wasteful in the transmission of power, and if the line shafting is at right angles, no possible arrangement of either bevel gearing or flat belts will give such satisfactory results as V belts, provided that the sizes of the pulleys are properly proportioned; that the thickness of the belt is suitable; and the angle of the V is also properly proportioned to the requirements.

ASHES AN EMBRY.—A manufacturer whose business requires the use of large amounts of emery, has been trying an experiment with the ashes of anthracite coal, and he affirms that he has obtained good results from the use of ashes as a substitute for the finer grade of emery. He takes ashes and saturates them with water, the liquid being poured off after standing an hour or two, then being poured off again, and so until he obtains several grades, down to a substitute for emery flour. When dried, the deposit cuts readily and leaves a satisfactory surface.

ORGAN PIPES made from paper have been patented by Giles Beach, of Gloversville, N. Y., and are now in satisfactory use. These pipes possess important advantages, being lighter, impervious to moisture, unaltered by variations of temperature, more easily transported and with greater safety. The tones produced are not inferior to those of metal pipes.

TO PREVENT CORROSION IN STEEL PENS.—According to the *Moniteur des Produits Chimiques*, this can be done by placing them for half an hour in a solution of sulphate of copper, and then letting them dry slowly. Of course the process simply gives the steel a thin coating of copper, which is not likely to be affected by any of the inks in ordinary use.

HARDENING PAPER.—Paper can be hardened without destroying its pliability by the following process: Pass the paper quickly through strong oil of vitriol and wash thoroughly in running water; or use hot syrupy solution (aqueous) of zinc chloride, and rinse quickly and thoroughly in water containing a trace of soda.

SCIENTIFIC AND MECHANICAL.

ROAD MATERIALS.—"Whinstone is the most durable of all materials, and wherever it is well and judiciously applied the roads are comparatively good and cheap. A road made of small broken stone to the depth of 10 inches will be smooth and durable. Ordinary-sized wheels touch the road for about an inch of their circumference, and every piece of stone put into the road which exceeds an inch in any of its dimensions is mischievous. The stones should be broken so that none shall exceed six ounces in weight. Every road is to be made of broken stone, without mixture of earth, clay, chalk, or any other material that will imbibe water and be affected with frost. Nothing is to be laid on the clean stone on pretence of binding; broken stone will combine, by its own angles, into a smooth, solid surface that cannot be affected by vicissitudes of weather, or displaced by the action of wheels, which will pass over it without a jolt, and consequently without injury."—*J. L. M'Adam, on Roads.*

SECURING GLASS IN SKYLIGHTS, ROOFS AND .—A recent English patent shows what seems to us a very convenient and reliable way of fastening sheets of glass in skylight frames of either wood or iron. In the case of a wooden rafter a piece of sheet lead is cut three and one-half times the width of the rafter, laid across the rafter, projecting equally on either side, and nailed at intervals. The lead is then doubled back over the heads of the nails to the center of the rafter on either side and turned up at a right angle. The glass is then laid and the lead turned down over the face of the glass so that when finished the lead covers the glass the same width of the rafter. If T iron is used for a rafter the lead is doubled under the edge of the T instead of nailed, as in the case of wood, and in all other respects handled just the same as with wood.

A NEW WHITE LEAD PROCESS.—The production of white lead has given rise to various processes and improvements, one of the most recent of the alleged improvements in this line being as follows: Very fine ground litharge is subjected, in a mixing vessel, to a salt brine, by the action of which chloride of lead and caustic soda are produced. This mass is then run into an iron vessel, into which carbonic acid is pumped, causing a further chemical change in the production of carbonate of lead and common salt once more, and the latter, being washed out from the white lead, may be used over again as in the first operation. It is stated, however, that though the article produced in this way is very white and chemically pure, it is somewhat less heavy than that made by the old process.

TO DISTINGUISH AMBER.—Some of the ways of distinguishing amber from copal are thus given in *La Nature*: "Copal is yellow, of a more or less deep tint, but uniform throughout, and has yellow points like sulphur on its surface. Amber in a fragment of 12 centimeters in length will show a variation in shade. Amber when rubbed will yield a strong aromatic odor; its imitations will not. Amber may be bent after being smeared with tallow and heated; the imitations will not bend. Amber may be cut, sawed, rasped or polished, but cannot be cemented or soldered like copal. The density of amber is 1.09 to 1.11; that of copal is 1.04."

THE BLUE OF THE SKY.—M. Chappuis thinks that the blue of the sky may be due to ozone present in the upper regions of the air. He argues that the electrical discharges constantly taking place will produce ozone; and the recent researches of himself and M. Hautefeuille have shown that ozone, at any rate when near its condensation point, is of a blue tint. He has examined the absorption spectrum of ozone and finds nine dark bands in it, three at least of which correspond with known bands in the telluric spectrum.

DOMESTIC RECIPES.

JULIET CORSON'S WAY WITH POTATOES.—Lives there a cook with a soul so dead as not to be willing to expend all the powers of fire, water and salt to produce mealy potatoes? If so, the writing of her epitaph would be a cheerful task. And if cold ones are left they can rehabilitate themselves in favor by appearing chopped, moistened with white sauce or cream, and either fried in butter or baked quickly, with a covering of bread crumbs. Steam fried, that is sliced raw, put into a covered pan over the fire, with butter and seasoning, and kept covered until tender, with only enough stirring to prevent burning, they are capital. To fry them Lyonnaise style they are cooked in their jackets to keep them whole, sliced about a quarter of an inch thick, browned in butter, with a little sliced onion, sprinkled with chopped parsley, pepper and salt, and served hot. Larded, they have bits of fat ham, or bacon inserted in them, and are baked tender. Note well that the more expeditiously a baked potato is cooked and eaten the better it will be.

FLOATING ISLAND.—Make a boiled custard of the yolks of six eggs, a large quart of milk, sugar to sweeten and a pinch of salt. The yolks must be well beaten and strained before adding to the milk. Flavor the custard and while boiling hot pour into a dish and spread the whipped whites smoothly over the top. Cover tightly to cook the whites. When cold, sift powdered sugar over the top, and you may, if you wish, strew over grated cocoa-nut, or bits of jelly or jam.

PLUM PUDDING.—One pound of suet, chopped fine; one lb. of English currants; one lb. of raisins; one and a half lbs. of flour; cloves, cinnamon and nutmeg, one-half teaspoonful each. One large tablespoonful salt. Mix all well together, then add two cups sugar, one cup molasses, seven eggs and a half pint sweet milk. To be made over night, then put in a cloth and boil four hours. To be eaten with sweet sauce.

TO REMOVE TAR.—A correspondent writes that "tar is instantaneously removed from hand and fingers by rubbing with the outside of fresh orange or lemon peel, and wiping dry immediately after. It is astonishing what a small piece will clean. The volatile oils in the skins dissolve the tar, and so it can be wiped off."

TO DISSOLVE SILVER FROM PLATED GOODS.—Mix one ounce of finely powdered saltpeter with ten ounces sulphuric acid, and steep the goods in this mixture. If diluted with water, it acts on copper and other metals, but is very strong, it dissolves the silver only, and may be used to dissolve off plated goods without affecting the other metals.

PYRAMIDAL SECRETS.—A Cairo (Egypt) despatch of May 31 says: "Maspero has just opened some more pyramids of the Sakkaro, enclosing the tombs of the kings of the fifth dynasty. The mortuary chapels of each contain about 60 square meters of the smallest and most closely written texts, giving precise details of the religious belief of that age. It is a complete *coup de grace* to the Ostrin Maemio theory, and all previous conceptions are entirely upset. Except the finding of the Rosetta stone in 1799, no discovery in Egypt equals this in scientific value. The entrance passage is difficult and dangerous on account of the loose blocks that encumber it. An American Egyptologist and a correspondent are the only persons allowed to visit the interior with Maspero. The latter explorer returns to Paris next month, and will publish the discovered texts. All the Sakkaro pyramids, about 60 in number, will be opened as soon as possible."