Recent Foreign Inventions.

Curing Croup in Hens, &c.—John Baily, of London, patentee.—This invention consists in forming pills of the following ingredients :—Powdered Jesuit's-bark, 2½ grains; powdered ginger, 2½; powdered rhubarb, 2½; sulphate of zinc, 1-10 of a grain, and water, 2 grains. This is divided into five parts, and one crammed down the throat of the ailing biped every two hours until a cure is effected.

To make Sea Water fit for Washing.—E. Heard, of London, chemist, patentee.—The inventor takes the common soda sold in shops, and roasts it in an iron pan until its water of crystallization is expelled. It must be kept stirred during the roasting to prevent it adhering to the iron. When dry, it is ground in a mill to a fine powder, and is then mixed with an equal quantity of sifted dry slacked lime. It is then in a fit state to be used for softening salt water by dissolving some of it in hot water, and then pouring the solution into the vessel containing the salt water. A sediment soon falls to the bottom; this is allowed to settle and the clear water poured off for use. The salt—soda and lime—to produce this effect is a simple caustic alkali.

Gilding Porcelain, Glass, &c.—William Cornelius, of London, patentee.—This invention relates to the preparation of the gold employed for the purpose described in the title. The inventor dissolves the gold in nitro-muriatic acid, and precipitates it by pure liquid ammonia (such as is commonly used by engravers,) and then washes and carefully filters the solution through an ordinary filter, and thus obtains a voluminous yellow metallic residuum, which, for the purposes of the invention, should be kept in a moist state with oil until it is required to be used in the manufacture of the gilding preparation. When used for such purposes he mixes the residuum with a corrosive mixture, composed of two parts of the finest rosin, and two parts of lac varnish, "and when the mass has been thoroughly mixed and incorporated together, and is perfectly dried, it is then entirely divested of its explosive property, by which it can be worked with safety; and this compound, when mixed with boracic bismuth, has been found to produce gilding of great solidity, but which requires slightly burnishing."

Separating Emery from other Matters.—F. C. Calvert, of Manchester, Eng., chemist, patentee.—This invention consists in agitating emery for some time, in a quantity of oil, pouring the latter off and then washing the oil away from the emery. The patentee describes several methods of removing oils and other impurities from emery, without diminishing its hardness. This is effected, in one of these methods, "by boiling it with a solution of caustic alkalies or their carbonates, or other metallic oxyds, such as those of lime, baryta, strontia;" but the patentee prefers employing a solution of caustic soda of a specific gravity of 0·015, the strength and quantity to be used varying, of course, with the quantity of oils or fatty matter which the impure spent emery contains. To facilitate the action of the alkali on the fatty matters, the whole is placed in a cast-iron boiler, and whilst being heated, either by steam or by the direct application of fire, the mass is kept in a constant motion by an apparatus consisting of a revolving perpendicular shaft, having an arm or arms projecting horizontally from it, or by some other agitator producing the same results. When the saponification is accomplished, the soapy liquor is run into a separate vessel, where it is mixed with a sufficient amount of acid to separate the fatty acids, which are then washed, and may be used for various purposes. A stream of water is then introduced into the vessel containing the emery, the agitator being all the time kept in motion, and, owing to the high specific gravity of the emery, the greatest portion of the impurities mixed with it are washed away.

Preserving Potato Seeds.—C. S. Jackson, of London, patentee.—This invention is to preserve potato and other roots to be used as seeds, and to prevent them from being injured by rot, fungus, or worms. To do this, a solution of the sulphate of zinc is made up, (about 1 lb. for 30 gallons water) and when cold the potatoes are steeped in it for a few minutes, then taken out, dried, and put past till spring, in a dry, cool place. This information may be very useful to many of our gardeners and farmers this year, in the preservation of choice seeds and roots.

Preserving Timber.—The same gentleman has secured a patent for the use of salts of zinc, alumina, and the muriate of ammonia, for preserving timber. The timber is steeped for some time in a solution of these salts, then taken out and dried in a warm room, or by exposure to hot sunshine. It is a good solution for the purpose, but will answer as well without the ammoniacal salt.

Collated from the "London Mechanic's Magazine," "Newton's Journal," and "Artizan."

Melting Point and Transformation of Sulphur.

Sir B. C. Brodie, F. R. S., read a paper on Sulphur, at a recent meeting of the London Royal Society—in the course of which he remarked that in the various treatises of chemistry, great discrepancies exist respecting the melting point of sulphur, so much so that he was led to make several experiments, with the view of discovering, if possible, the true laws which regulate the transformation of sulphur and its liquidation. The melting point of sulphur varies according to its allotropic condition. This condition is readily altered by heat, and invariably, without peculiar precautions, by melting. Hence the temperature at which sulphur melts is different from that at which it will solidify, or at which, having been melted, it will melt again. The melting point of the octohedral sulphur is 114·5°. But from the facility with which this sulphur, when heated even below its melting point, passes into the sulphur of the oblique system, this fact may readily be overlooked. When this sulphur, even in the shape of fine powder, is heated for the shortest time, between 100° and 114·5°, this change cannot be avoided. For the transformation of large crystals a longer time is required. At a certain point the crystals become opaque, and are often broken in pieces at the moment of the change. When sulphur has been converted by heating a sufficient length of time, it acquires a fixed melting point of 120°. This is the melting point of the oblique prismatic sulphur. If sulphur thus converted be carefully melted, so as to raise the temperature as little as possible above the melting point, no sensible difference will be observed between the point of melting and that of solidification. To obtain this fixed melting point of 120°, care must be taken that the transformation of the sulphur has been thoroughly effected. If this be not done, it may melt at any point between 114·5° and 120°. If, however, the temperature of the melted sulphur be raised above its melting point of 120° the point of solidification will be altered, and will lie even below the first melting point of 114·5°. The sulphur which is insoluble is bi-sulphide of carbon. This is prepared by extracting the hardened viscid sulphur with that re-agent, which has a melting point considerably above 120°, but which the author has not been able to determine with precision. It is stated in chemical treatises that the opacity, which on solidification comes over the melted sulphur, is due to the transformation of the oblique prismatic into the octohedral sulphur, and the consequent disruption of the crystal. To this cause is also attributed the evolution of heat, which has been observed in solid sulphur immediately after cooling. There are, however, no sufficient grounds for this view, and some of the observations are decidedly adverse to it. On extracting melted sulphur which had become opaque with the bi-sulphide of carbon, traces of insoluble matter were constantly found, even when the greatest precaution had been taken to avoid elevation of temperature, and this opacity appears to be due to the hardening of the viscid sulphur, and the consequent deposition of opaque matters in the pores of the crystals, which is quite sufficient to account for it. It remains, therefore, to ascertain the cause of the evolution of the heat; and on this point the author suggests that when the sulphur is tempered, the change takes place very slowly, and the heat evolved is not perceived. This view is confirmed by a fact that the viscid sulphur possesses another solid form. Sir B. C. B. has found, moreover, that when sulphur melted at a high temperature is suddenly exposed to intense cold, such as the cold of solid carbonic acid and ether, the sulphur formed is not viscid, but solid, hard, and perfectly transparent. When the temperature is allowed to rise to that of the air this sulphur becomes soft and elastic.

Freaks of Lightning.

Lightning has been often known to cut curious capers, but rarely have we observed a more singular example of its eccentricity than occurred at the house of Mr. Ellis, in Philadelphia, a few days ago. The "Philadelphia Ledger" says:

"It came down the chimney into the library, scattering the books in every direction, driving the plaster from one side of the room into the hard wall on the opposite side. It entered a large desk of clothing and silver ware, the lid of which was screwed down, burst the chest open in the centre, and knocked one end completely out of it. It descended into the closet, scattered and broke the crockery, tore the closed door off its hinges, and piled many of the utensils in the centre of the room. A tin pepper box was shown to us, which had a small hole in the side near the bottom, perforated as if by a buck shot, through which the lightning passed, melted the solder from the lid, and passed out at the top, throwing the lid into the centre of the room. The house had fourteen occupants in it, and not one of them was injured, and the children were not even wakened by the explosion. The sleeping room of Mr. Ellis was so filled with dust and the smell of sulphur, that he was nearly suffocated before he could open the doors."

[It is something singular and unaccounted for, that a sulphurous smell is always felt by those who have been in a house struck by lightning.

During severe thunder storms, we have heard many persons relate that they have noticed this offensive sulphurous odor. The only way that we can account for it, is the presence of ozone.

By passing a number of electric currents through a portion of the atmosphere, it is converted into ozone, and perhaps the lightning performs the same office, on a large scale, during thunder storms, that electric sparks do on a small scale, in the laboratory.

(For the Scientific American.)

Flying.

Absence from home prevented my seeing the reply of "J. W.," on page 243, until the present time. He says that "it *can* be demonstrated by known laws of mechanics that birds can fly." But in place of a demonstration he merely gives his views on the subject; and states that he drew them from the "Scientific American." Now he has read the "Scientific American" differently from what I have, if he has found any thing in it that inculcates the idea that a bird sailing above the earth in a breeze of wind, is affected any more by it than if it were in a dead calm. Or that it, when breasting the wind, would be lifted up as a kite would be when held by a string. Birds in a gale, were it not that they see the earth apparently moving below them, would be no more sensible of it than the passengers in a car moving forty miles an hour are of its progression. It is true, that after making a swoop to gain impetus, it will, by elevating its front, "mount up an inclined plane of air, as it were;" but from known laws of mechanics it could not mount so high as the point from which it took its swoop, any more than a railroad car turned loose at the top of an inclined plane, could be made to ascend another inclined plane, by its impetus alone, higher than its starting point. There are two forces operating that have continually to be overcome by birds while flying. The force of gravity tending to bring them to the earth, and the resistance of the atmosphere through which they move. The initial velocity alone would carry a bird forward but a few seconds before the resistance of the air would entirely stop its motion, and the force of gravity brings it to the earth; yet we observe the common vulture sail slowly through the air for many minutes without flapping its wings at all, or moving any slower, and yet mounting higher all the while.

If "J. W." will ascertain the velocity with which a bird moves, and its weight; he may, by taking the size of its wing and the distance and frequency of the flap, ascertain the mechanical force exerted against the air to impel the bird forward and sustain it in the air. If this should exceed the force of gravity and the resistance of the air, the bird flies mechanically, if not, it is possessed of some unknown power. By making the calculation it will be found that even pigeons do not exert a sufficient force with their wings to against the air to overcome the resistance of the atmosphere in their flight, and sustain them in the air against gravity.

If a vulture should start to sail through the air with a certain velocity, and neither have its front elevated or depressed, by the known laws of mechanics, gravity would bring it to the earth as soon as if it were not progressing at all; and if its front should be kept so much elevated as to make it move parallel to the surface of the earth, then the sliding up the inclined plane of air, which is all the while sinking under it, will arrest its progress in the same time that it would acquire its initial velocity by falling from rest in vacuo. This, with the common vulture, would be about two seconds. In fact it cannot be proven by the known laws of mechanics that a bird can sustain itself at the same elevation in the air without flapping its wings for three seconds of time; yet we often see them sustain themselves several minutes without moving a wing.

I asked for a demonstration, not an opinion.

Jackson, Tenn. J. B. C.

(For the Scientific American.)

To Purify Hard Water for Steam Boilers.

Make a cistern to contain as much water as the steam boiler which it is destined to supply, and set it, if convenient, over the boiler; divide it into four or more compartments connected together, and fill all but one with wood shavings. Then make a tight trunk, about 12 by 12, breadth and depth, but as long as the cistern, and place this on the top of the latter. The cold water for the supply is to be pumped into this trunk near one end, and it falls down into the cistern at the other end, into the first compartment filled with shavings. The exhaust steam from the engine, is passed by a pipe, through the trunk, and then through the cistern—out at the end of the latter—and will impart sufficient heat to boil the water. As the water falls from the trunk into the cistern below, it should be allowed to pass over the edge of the division of the first chamber, into the second, and under the second into the third, then over the third, and so on, to the last, from which it passes to the boiler. By this plan the lime is deposited among the shavings, and the water rendered so pure as to prevent trouble in the boiler, either from incrustations or mud. The water I use is of the hardest kind, yet by this arrangement I have run my mill for four months without cleaning out, and then found no lime and but little mud in the boiler. The shavings must be renewed occasionally. Yours, Nathan White.

Delphos, Tenn., June 11, 1854.

American Linen Factory.

A new linen factory has commenced operations at Fall River, Mass. The capital stock of the company is $500,000. The main building is of four stories, and 300 by 63 feet. The bleachery and store house of three stories, are about half as long. The number of spindles is 10,500; looms 250—when in full operation, about 500. The number of males employed is 130, females 160; when in full operation about five hundred persons will be employed.

A Great Bridge.

On the Illinois Central Railroad, there is a bridge erecting two thirds of a mile long, 75 ft. high, and contains upwards of 1,000,000 feet of timber. The top is to be covered with tin.

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