

P. H. C. says: It is a popular belief among the mass of farmers that the influence of the moon has an important bearing upon various young plants as they happen to come forth either in her light, as full moon, etc., or in her wane. This idea is ridiculed and entirely disbelieved by what are called the most intelligent and scientific farmers. Is it not a fact that the light of the full moon on a young plant just come forth would have some effect on it, different from the darkness which prevails in the moon's absence, and do not these tender plants require extra sleep, as an infant does? And in the absence of it, does it not essentially change their character and production? A. When the moon is shining, the clouds are wholly or in great part absent, and the effect of the absence of clouds becomes very evident when a thermometer is placed in the focus of a silvered mirror and turned towards the unclouded sky. The thermometer falls with great rapidity, its heat being radiated out into the abysses of space, which are estimated to have a temperature vastly below the zero of our thermometric scale. When a cloud passes between the mirror and the sky, the thermometer rises rapidly, the loss of heat being interrupted. The cloud acts like a woolen blanket, preventing the escape of heat. Now what the thermometer is in this experiment, so in nature is the plant. On a moonlight (cloudless or partly clouded) night, it may radiate so much heat that injury may arise to its tender organization. The Earl of Rosse's great telescope has detected the heat radiated by the moon, but it is an incredibly minute quantity, and can have no effect on vegetation.

E. L. S. asks: How can I construct a blow-pipe? Illuminating gas is not to be used, and the atmospheric air is to be supplied by some arrangement worked with the foot. A. A small blacksmith's bellows may be used, and fastened between the legs of a table, with weights on the upper chamber, and a treadle playing against the lower chamber, so as to give the requisite pressure. A pipe leading from the nozzle of the bellows, through the table top, is made to end in a tapered jet, so mounted that its direction may be altered at pressure. The jet plays a short distance above the wick of an ordinary lamp.

Y. M. C. A. asks: What are the chemical ingredients and proportions of the same in what is known as slag, the kind that runs from a wrought iron puddling or heating furnace? A. Composition in 100 parts of samples from puddling furnace: Iron 54.33, oxygen 16.87, silica 8.32, phosphoric acid 7.29, sulphur 0.70, lime 4.70, oxide of manganese 0.78, magnesia 0.26. Total 99.62.

W. H. N. asks: 1. What is type metal composed of, and what are the proportions? A. Type metal is composed of lead with 1/4 or 1/2 of its weight of antimony, or lead 2 parts, tin 1 part, antimony 1 part, or lead 15 parts, tin 1 part, antimony 4 parts. 2. Can you give me a recipe for an ink that shows plainly when written with, but fades entirely away a short time afterward? A. A solution of chloride of cobalt.

B. & J. say: In trying to make a zinc casting in a plaster mold, on pouring in the zinc it splattered so that it would not stay in the mold. Then we tried a wooden mold, but found it to be full of air holes. Next we tried a sand mold, but this also was full of air holes; and lastly we tried another plaster mold, and, after standing over the stove all day, we found that the zinc splattered same as before. We thought all the dampness had been dried out, but there was something wrong. In looking at some zinc castings, we found they looked very smooth. We melted scrap zinc. Will you inform me what was the matter, and how to cast zinc? A. The difficulty has been that the plaster molds have given off moisture, even the warmth of the stove has not prevented it. The wooden molds of coarse formed gases in contact with the molten metal. The sand has not been dry enough. We have never experienced any difficulty. Molders' sand, just moist enough to work, is used. Castings, as bright as silver, may be obtained in this way, even with common scrap zinc. To be more sure, vent holes may be punched with a wire, and the mold may be still further dried, but these precautions are hardly necessary.

J. A. W. says: In running printing power presses on highly calendered, dry paper, we are at times very much troubled, by the paper becoming charged with electricity in its passage through the press. Can we get rid of it, or prevent said paper from becoming so charged? A. In the Times newspaper office in this city they obviate similar trouble from electricity by attaching lightning rods to the printing press. The rods extend down into the earth.

H. B. S. asks: Why does ice form upon the bottoms of rivers, where the water passes at three or four miles per hour? The ice seems to form in clear cold weather, and can be seen to rise during the day, bringing with it gravel stones of considerable size. A. It will be found, we think, that in these cases the temperature of the water is below the freezing point, and that if the motion of the water were arrested it would speedily become covered with a thick sheet of ice. Now ice is formed by the union of innumerable small detached crystals, which unite together, and being lighter than water, float upon the surface and are carried off, while those crystals, which in the process of formation freeze fast to the stones at the bottom, and form points of attachment for still other crystals, remain there until the buoyancy of a large mass of them eventually carries them up to the surface.

W. T. R. asks: 1. What are the acids used in Daniell's battery, and what is the proportion of acid and water? A. Saturate as much water as will fill the cells with powdered blue vitriol, and add one eighth, of the bulk of this liquid, of oil of vitriol. 3. How many cells should I use for plating small articles, such as spoons, etc.? A. Two are amply sufficient. 3. How can I tell when the current is passing? Should it be strong enough to be felt by holding the wire? A. By the fact that metal is being deposited upon the mold to be electroplated. 4. Is there a liquid blue vitriol, or must it be made by dissolving the crystals in water? A. By dissolving the crystals.

T. A. says: 1. I read of a new material called Parkesine (from the inventor, Mr. Parkes), composed chiefly of collodion, castor oil, and chloride of sulphur. Was this material patented? A. Yes. 2. How is the chloride of sulphur prepared? A. By passing chlorine gas, properly dried, over sulphur heated in a retort, and condensing the volatile chloride of sulphur thus formed.

E. R. asks: 1. How is the double sulphate of nickel and ammonia used for a bath? A. See p. 91, vol. 29. 2. Are the two salts mixed with distilled water? Will the nickel dissolve in the bath? A. The double sulphate of nickel and ammonia is one salt, not two. Use enough to make a strong solution in the distilled water. The nickel plates will dissolve. 3. How long after mixing is it till it is ready for plating? A. At once.

J. D. M. says: Professor Silliman, in his "Principles of Philosophy," p. 392, gives Faraday's third law of electrolysis as follows: "The oxidation of an atom of zinc in the battery generates exactly so much electricity as is required to resolve an atom of water into its elements. Thus 8.45 grains of zinc dissolved in the battery occasions the electrolysis of 2.35 grains of water. But these numbers are in the ratio of 32.5:9, the equivalents of zinc and of water." 1. Now does this mean that the dissolution of 8.45 grains of zinc in each cell or couple of the battery is required to occasion the electrolysis of 2.35 grains of water, or does it mean the sum of the several amounts of zinc dissolved in each cell or couple of the battery (making in all 8.45 grains) causes the electrolysis of 2.35 grains of water? A. For every 8.45 grains of zinc dissolved in the battery, whatever the number of cells, 2.35 grains of water are electrolyzed; so that the amount of water decomposed is found by adding the amount of zinc consumed in all the cells together and dividing by 2.35.

W. D. S. asks: Will ripe fruit keep in a vacuum or partial vacuum, such as can be obtained with an air pump, without preparation of the fruit or putting anything in to preserve it? If it will keep, what is the reason that fruit isn't put up in this manner? A. Fruit contains germs of decay, which must first be destroyed, otherwise the formation of a vacuum about them will not suffice to preserve the fruit.

S. G. N. asks: 1. Will it be cheaper for me to make my own pure silver anodes for silver plating from coin silver, or to buy them from a silversmith? A. It will probably be cheaper to purchase it. 2. How is the quantity of electricity measured, and how the intensity? A. They are determined by the galvanometer. The intensity of a current is directly proportional to the tangent of the angle of deflection, provided the dimensions of the needle are sufficiently small as compared with the diameter of the circuit. The relation between the intensity and the quantity is that the former is the quantity of electricity which in any unit of time flows through a section of the circuit. 3. How large must a copper wire be for a Bunsen battery, consisting of two 1 gallon cells? A. A wire the 1-10th of an inch diameter is sufficiently large. 4. Are Daniell's batteries suitable for silver plating? A. They can be employed. 5. Should melted zinc be stirred while on the fire? A. There is no advantage in so doing.

J. F. W. asks: What will remove champagne stains and grease spots from a black velvet coat? A. Rub the stains first with ammonia and afterwards with benzine.

J. H. P. says: My hydrogen lamp does not quite meet my expectation. The gas has no effect upon the sponge till I blow upon it with my mouth, when in a second or two the sponge turns red and ignites the gas. A. The platinum sponge causes the union of the hydrogen with the oxygen of the air by what is known as "contact action," or the power which a clean surface of platinum has of condensing gases upon its surface, and thus bringing them within the range of their mutual attraction, and causing combination or combustion. By exposure to the air the surfaces become dirty. Heating for a moment with the tip of a flame is the best mode of restoring the activity.

A. S. B. says: Please give me the process of calcining gypsum, and state the required heat. A. Gypsum is calcined in an oven or kiln. It is built of walls of strong masonry, spanned by a flat arch. In this room is placed the gypsum only, the fire being lighted in a series of small chambers in the lower part of the room; brushwood is the best fuel. Or the kiln may be divided unequally by an arch about one foot from the floor, the gypsum being introduced into the upper part. The under parts in connection with the flue of a furnace, the flues from which, driven by a draft, are carried to play upon the lower part of the arch, the hot air and gases passing into the upper rooms. The aqueous vapor escapes through the roof of the kiln.

S. T. W. says, in reply to correspondents who ask how to season wood and to prevent its warping: Strip off bark, and bury about one foot deep in the spring, leaving in the ground for six months, and you will find no difficulty. This was the only way by which we could season the sapwood of mountain mahogany in the Sierra Nevada, it being one of the hardest and most brittle kinds of wood known. I have two cases now of this wood, nearly as heavy as iron. In company with three others I cut them on July 4, 1873. The tree was cut at an elevation of 10,000 feet; it grows very slowly, and seldom to over four inches diameter and 10 or 12 feet high. It flowers in June, usually, in favorable localities, having a small, pale pink and fragrant flower.

W. R. A. R. says, in reply to W. W., who asked for a recipe for gilding without a battery: Dissolve 20 grains chloride of gold in a solution of cyanide of potassium, 1 oz. to 1 pint pure water. Put the solution of cyanide of gold in a glass or porcelain jar; place in it the articles to be gilded in contact with a piece of bright zinc, in the solution near them; the process will be hastened by a gentle warmth. If the gold is deposited on the zinc, rub a little shellac varnish on it. The chloride of gold may be prepared by dissolving gold in aqua regia in the proportions of 16 grains gold to 1 oz. acids.

D. M. says, in reply to C. L. C.'s enquiry for a cheap instrument to foretell a storm by pressure: The baroscope of Babinet will answer your needs; it may be constructed thus: Take any bottle; pour colored water into it, about one fourth of the quantity the bottle will hold; insert in it a glass tube, from three to four feet long and passing airtight through the stopper, which must also be airtight. Let a paper index, divided according to any scale of division, say into inches and fractions of an inch, be glued to the glass tube. Blow into the glass tube, so as to cause the water to ascend the tube a few inches, say 40 inches, and the instrument is constructed. The bottle must be placed in another vessel, and protected by sawdust, or some other material, from the influence of changes in the temperature of the atmosphere. This very sensible instrument records faithfully any change in the density of the external air, and the approach of a storm will infallibly be indicated by a sudden rise of the water in the glass tube.

G. L. W. says, in answer to M. B. A., who asked how to remove tallow and white lead from machinery: Use turpentine, and rub it in well.

G. H. M. says, in reply to several correspondents who ask how to cut glass jars: Fill the jar with lard oil to where you want to cut the jar; then heat an iron rod or bar to red heat, immerse it in the oil; the unequal expansion will check the jar all round at the surface of the oil, and you can lift off the top part.

J. A. O. says: Allow me to add to the list of railway bridges across the Mississippi river, given by you on p. 252 in reply to J. M., the following: Louisiana, Mo., St. Paul, St. Cloud, and Brainard, Minn., making a total of fifteen.

C. B. L. says, in reply to several correspondents who asked how to remove tattoo marks from the skin: Blister the part with a plaster a little larger than the mark; then keep the place open for a week with an ointment; finally, dress it to get well. As the new skin grows, the tattoo marks will disappear.

S. P. N. says, in explanation of the excretion on the plank, and the means by which it was produced: "I am a farmer, and sometimes have occasion for a tight trough. In making it, I joint up the plank and then, with a wide punch, set down a groove about 1-16 inch deep the whole length; then take of two or three shavings more, and put the trough together. When the wet gets into that joint the groove swells out again just the thickness it was at first, and of course two or three shavings thicker than the plank, and so closes all up tight. Wood can also be ornamented by punching down carefully in patterns, planing it a little, and then wetting; the parts punched down show in relief above the planed surface and make quite a puzzle."

M. S. T. says, in answer to M. B. A., who asks how to remove tallow and white lead that has been applied to polished parts of machinery to prevent rust: Try a concentrated solution of caustic potash, scrubbing with an old scrubbing brush. It answered in a case somewhat similar to yours.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined with the results stated:

Y. N.—It is yellow hematite, and contains about 85 per cent of oxide of iron.

E. G. A.—The grains are mica, and the rock is granite. J. E.—Both are pyrites, and are not valuable.

C. S.—A very beautiful specimen of galena, or sulphuret of lead.

W. F. H.—Your specimen is impure crystallized limestone. It may be used in making caustic lime.

J. W. H.—The mineral is sulphide of iron. If a small percentage of nickel is present, it will require a more extended examination than could be given in a preliminary analysis, to determine it.

A. L. asks: Can you give me a recipe for making artificial honey?—J. T. asks: What kind of paint should I apply to terra cotta window caps, etc., to protect them from the weather?—W. D. M. asks: How can I harden the brains and other organs of animals, so that I can take plaster casts of them?—A. J. F. asks: Is it possible to make an alloy by fusing glass and a metal together?—A. F. asks: What can I put on paper muslin to prevent the paint spreading?—J. H. asks: How can I make chewing gum and stencil paste?—D. H. S. Jr. proposes to put bolting cloth on a reel in strips, tacking the upper edge to the outside face of a rib, and the lower edge to the inside face of the next rib below; so that the four shall not slide against the rib and be carried up thereby, but shall slide off the edge of one piece of cloth and on to the next, falling the thickness of a rib only. Will this plan work well?—J. W. T. S. asks: What will cure chickens affected with a disease called the chicken cholera, and what will prevent them from catching the disorder?—C. H. R. says: You credit James Bocardus with the invention of the "ring flyer." Can you inform me when and where the invention was made, and give me any details of when the first ring spinning frame was put in operation, and if it is in existence now?—E. T. C. says: Some wagon makers boil their hubs till soft and drive the spokes while the hubs are hot; others boil the spokes; others have both as dry as possible. What is the best method?

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

On a Column for Boys. By D. W. H.  
On the Mississippi Overflow. By H. S.

Also enquiries and answers from the following:

P. H. B.—M. J. T.—S. M.,  
Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writers should always be given.

Several correspondents request us to publish replies to their enquiries about the patentability of their inventions, etc. Such enquiries will only be answered by letter, and the parties should give their addresses.

Correspondents who write to ask the address of certain manufacturers, or where specified articles are to be had, also those having goods for sale, or who want to find partners, should send with their communications an amount sufficient to cover the cost of publication under the head of "Business and Personal," which is specially devoted to such enquiries.

[OFFICIAL.]

Index of Inventions FOR WHICH Letters Patent of the United States WERE GRANTED IN THE WEEK ENDING April 21, 1874, AND EACH BEARING THAT DATE. [Those marked (r) are reissued patents.]

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