

Notes & Queries.

[We present herewith a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers.]

1.—DYEING QUESTIONS.—Will some reader of the SCIENTIFIC AMERICAN inform me how to dye a bright Prussian blue, also a dark green, and a solferino on raw cotton?—W. H.

2.—ADHESION OF RUBBER BELTS TO PULLEYS.—What is the best preparation for moistening heavy rubber belts, put to heavy strains as in saw mills, etc., to make them adhere to the pulleys, and preventing slipping, at the same time not injuring the belt or grating the pulleys?—O. E. S.

3.—POTATO STARCH.—What percentage of starch can be obtained from the potato; and what machinery is required for its manufacture?—X. Y. Z.

4.—FORCING CEMENT INTO FISSURES.—What is the best means to force cement (hydraulic) into a wall or cavity extending upward higher than the point of injection, as into the roof of a dam built across an adit in mines, so as to make a water tight job?—T. S. M.

5.—RELATIVE STRENGTH OF IRON AND WOOD.—Can any one tell me of what thickness of plate a hollow iron spar would require to be built—of say 20 inches diameter—to equal in strength a first rate pine spar of the same diameter, supposing them each to be 60 feet in length? Also, whether there would require to be any angle or T iron up the inside of it? Or would the boiler plate alone be sufficient?—H. A. C.

6.—VACUUM IN CASKS AND MINES.—Upon what principle of physics is it that, when the faucet of a liquor cask is opened without any vent above having been provided, the air, by jerks, seeks to enter in? If the answer be that it mounts to fill the empty space which the liquor, by jerks, leaves in descending, the question is why that liquor does not stay up steadily, being so far within the limit of thirty feet in height? Again, is it, or is it not, a cognate phenomenon, that a current of air is set agoing in a deep mine, along a gallery having communication with the upper air only by a single orifice through a partial partition wall along the middle of such gallery, partial because, stopping short at the farther end, or breast, it so gives room for a round of motion of the air? It is frequently resorted to, in the mining region, as a means of ventilating the deep mines. The questions are: In the first case, if the weight of atmosphere was sufficient to counter balance hydrostatic pressure of liquor in the cask, why did it not do it? Secondly, in the case of the mine, since the heavier air was already at the bottom, why did it not stay there?—J. A. P.

7.—VARNISH FOR VIOLIN.—Will some of your readers tell me how I can prepare varnish for a violin? I have been told that there must be no oil about it. How can I stain the violin a darker color than the natural wood?—J. D.

8.—POISON FOR WOLVES.—Will some of your correspondents inform me of a quick and deadly poison for wolves, other than strychnia crystals, which they are too sharp to eat?—S. C.

9.—DRIVING ELEVATOR.—I wish to use a long elevator where I cannot get power to the upper pulley conveniently. Will driving the lower pulley make it work? The ascending side will need to carry a load of about two hundred pounds.—C. W. W.

10.—GOLD SOLUTION AND BRONZING.—Will some of your readers please inform me how I can make a gold solution for gilding to be used by boiling, without a battery? And how can I do antique bronzing with a green shade?—F. M.

11.—PREPARATION OF INDIGO.—What amount of sulphuric acid is required to dissolve one pound of indigo? What is the best substance to use for neutralizing the acid, and how much is necessary for that purpose? What kind of a vessel is to be used for the process?—D. C.

12.—BOILER QUESTIONS.—Is there any cheaper or simpler method of feeding boilers, from a tank a little above the waterline in boiler, than with a steam pump? What is the best way of bringing the flame down the outside of an upright tubular boiler to increase its steam making capacity?—C. S. B.

13.—SALT IN THE EARTH.—During our late war, the men would occasionally get a piece of fresh meat to eat, and, when out of salt to season it, they dug the soil from under old houses and, leaching the water through it, cooked the meat in it. The latter would be found to be agreeably salted. How do you explain the presence of salt in the soil? There were no cellars under the houses. It was only necessary to procure the dirt where it was protected from the sun.—C. E. W.

14.—TENSION OF BELTS.—My plan for driving burrs from an upright shaft is condemned on account of the pulleys being too close. They are 6 feet between centers, and are respectively 2 feet and 3 feet in diameter. It is reasoned that a short belt requires a greater tension—which therefore is harder on the belt and spindle,—and will not transmit the same power. I contend there is no difference under like conditions, if tighter pulleys are used in each case, and the belts present the same surface to the pulleys. The tension may be given by tighteners or by the weight of the belt; they would be just the same, and transmit the same amount of power, and be no harder on the spindle. If I am wrong, why?—T. S. L.

Answers to Correspondents.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 100 a line, under the head of "Business and Personal."

ALL reference to back numbers must be by volume and page.

D. M., of Mich.—We think the specimen sent is what is called chrome iron, made from the ore known as spiegeleisen.

C. A., of Mass.—A body floating in a stream moves with the mean velocity of that part of the section of the current occupied by the submerged portion.

W. B. W., of Mo.—Judging from your description, your boiler furnace is all right. What is meant by furnaces out of shape, in boiler reports, is that such furnaces as are made of iron, in the boiler and forming a part thereof, are distorted.

W. H. W., of Conn.—You can use the differential screw for the purpose named; will publish your other query.

G. N. L., of —.—Your theory of vibrating flames is corroborated by modern research. Consult Tyndall's Lectures on Sound.

E. A. L., of —.—Water has been proved to be more compressible than some solids. Its density increasing, therefore, as the depth increases, there is a theoretical depth at which water would become as dense as, say, iron, and at which, therefore, iron would cease to sink. Practically, however, it is probable that there is no depth in the ocean to which any known solid that sinks at the surface will not descend. This answers your other queries.

T. B., of N. J.—Your plan for balloon propulsion by inclined floats is old; it has been tried and found wanting.

CHAPPED HANDS, ETC.—For these, or chapped lips, or chafed skin in any part of the body, no application is so good as glycerin, rubbed in twice a day. Two applications will generally cure any case of the sort.—B. T., of —.

MELTING ASPHALTUM.—Query No. 1, March 22, 1872.—The best solvent for asphaltum is oil of turpentine. Put in the mineral, and heat till it is dissolved. As the vapor of turpentine is dangerously inflammable, a water bath is the best vessel for the purpose.—D. B., of N. J.

LAKE DWELLINGS.—Query No. 11, March 22, 1872.—Sir Charles Lyell's work "The Antiquity of Man" contains all the information on this subject which has hitherto been obtained.—D. B., of N. J.

ANTS.—In answer to No. 20, page 169: Sprinkle lime on the places the ants frequent. If on shelves, spread paper over them. I think also that moles will not work among it.—H. C. M., of Pa.

FRUIT JELLIES.—M., No. 27, page 169, is exercised about fruit jellies. He will doubtless be surprised to learn that they are called "fruit jellies" because not a particle of fruit is used in making them. They are simply gelatin dissolved in water, colored, and flavored with the so-called flavoring extracts.—Alex., of —.

MOLES.—T. M. G. had better keep his moles till the wire and other worms in the soil are killed off by these useful animals. Moles would not be in his garden were there not pernicious worms, bugs, etc. to feed them. The moles won't touch his vegetables, but they are great on small deer like worms. As regards the ants, let T. M. G. get some quicklime and grind it fine; sift plenty of it on the ground where these insects make their holes. The lime should be fresh, so as not to have lost any causticity by slaking.—Alex., of —.

STOPPING CRACKS IN IRON.—If H. P. S., query 20, Feb. 24, will take some litharge and common glycerin, and make a paste or cement, he will be able to stop the leakage.—C. W. D., of Wis.

FRUIT JELLIES.—Query 27, page 169.—To M. Fruit jellies, so called, are made by putting half an ounce of alum in one pint of water; let it boil a minute, or till dissolved, then add four pounds white sugar; boil two minutes longer and strain; when cool, add half a two shilling bottle of vanilla, lemon, or strawberry extract or other flavor.—Mrs. E., of —.

TRANSFERRING TO GLASS.—Query 17, page 169.—K. W. can transfer engravings to wood or glass by first coating the wood or glass with copal varnish, then press on the picture, face downwards, smoothly and tightly; let it dry. Then damp the paper slightly, and rub it off with the finger, leaving the picture to be looked at through the glass, or, if on wood, to be varnished.—Mrs. K., of —.

CEMENTING EMERY TO WOOD.—To J. J. T., query 28, page 169. The following cement is wonderfully tough, as I have good reason to know: Melt together equal parts of shellac, white resin, and carbolic acid in crystals; add the last after the others are melted. The effect of the carbolic acid is surprising.—E. H. H., of Mass.

GINGER BEER.—Query 14, page 122.—To F. L. C. Take white sugar, 5 pounds, lemon juice, 1 gill, honey, ½ pound, bruised ginger, 5 ounces, water, 4½ gallons. Boil the ginger 30 minutes in three quarts of the water; when cold, put in the other ingredients and strain; add the white of an egg well beaten with a teaspoonful of lemon essence. In four days bottle; it will keep longer with the honey than with yeast.—Mrs. K., of —.

CLEANSING HAIR BRUSHES.—Query 25, page 169.—To F. C. To cleanse a hair brush, take a basin of cold suds, add a spoonful of spirits of ammonia, put in the brush, and draw a coarse comb through the bristles as many times as necessary; a cloth too may be used to help the cleansing. Finally rinse in clear water.—Mrs. K., of —.

TANNING RABBIT SKINS, ETC.—Query 4, page 169.—To L. H. T. A simple way to tan skins is, first, to wash them in cold suds; then dissolve pulverized salt-peter and alum in hot water, add cold water, and soak the skins in it all night; then hang them over a pole to drain; when nearly dry, sprinkle with powdered salt-peter and alum; fold the flesh sides together, lay them where they will not freeze, turn every day till dry, then scrape the flesh side with a blunt knife and rub with pumice stone and the hands.—Mrs. K., of —.

PAINTING SHEET IRON.—Query 18, March 16.—Let J. C. try asphaltum varnish on his sheet iron smoke stack.—V. S. V., of O.

TO DESTROY ANTS.—Take of flowers of brimstone, half a pound and potash, four ounces. Set in an earthen pan over the fire till dissolved and united; then pulverize and make, with water, a strong solution and sprinkle where the ants frequent.—F.

IGNITION OF STEEL FILINGS.—A. M., of Oregon.—The fact you mention is a familiar and convincing illustration of the nature of combustion. Steel in a mass is a very incombustible substance, but, reduced to a fine powder and sprinkled so as to allow a large proportion of the oxygen of atmospheric air to each granule, it burns readily. The experiment is a good illustration of the increase of chemical action secured by pulverizing materials.

EYE STONE.—A friend gave me an eye stone, and said it was a common article in the drug market, and used for removing dust, etc., from the eye. It looks on one side like a bivalve shell, but is plane on the other side. Is there such a thing known in the market? F. M. E., of Mo.—Answer: Yes. It is taken from the head of a fresh water crab.

COLORING SHELLS.—Query 3, March 16.—Dissolve a little lac eye in a solution of chloride of tin; and having made the shells thoroughly clean, dip them in this preparation until they are of the desired color. The dye should be allowed to stand (first after boiling) to allow of any settlement.—E. H. H., of Mass.

RAILROAD ACCIDENTS.—P. B. P., of Pa.—The device you send is not new, and the very great expense attending its use has prevented its general adoption.

ANTS AND MOLES.—T. M. G. should drop one or two castor oil beans in their holes, and he will then get rid of them.—K., of Md.

ELASTIC CEMENT.—W. M. S., query 10, March 16, can mend his gas bag by putting on a patch with a solution of rubber in bisulphide of carbon.—D. G. P., of Ill.

PAINTING IRON BATH TUB.—If C. A. H., query 15, March 16, will mix his paint to a proper consistency with best coachmaker's Japan varnish, it will give him satisfaction. For white lead paint, use half turpentine and half coachmaker's Japan. It will not darken much. Venetian red is best for a first coat, for any color but white.—P. D. W., of —.

O. E., of La.—We hardly think there would be danger of explosion from pulverizing chlorate of potash on clear white paper by roll-it with a bottle. Should there be, however, a small fragment of camphor, sulphur, phosphorus, resin, etc., upon the paper or bottle, you might produce an explosion. Violent friction will sometimes explode chlorate of potash, without the contact of other combustible materials. In such cases the explosion is not very dangerous, however, a small part only exploding, while the remainder deflagrates and decomposes more gradually. We should prefer a mortar and pestle, taking care not to use the pestle violently.

FLUID AND LIQUID.—Query 2, March 16.—To H. W. H. The words fluid and liquid are often used synonymously. Water is both fluid and liquid, but oxygen is fluid but not liquid. Both terms apply to those substances whose parts change their relative positions upon the slightest pressure.—D. G. P., of Ill.

BRASS COLORED PAINT.—O. W. V., query 9, March 16, will find fine copper bronze varnish as near to a brass colored point as anything he can get.—D. G. P., of Ill.

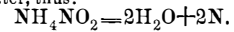
PIN SPOTS IN STEEL.—Let H. M. H., query 23, page 185, get a small iron box with a sliding top to it, fill it with pulverized charcoal, and imbed his pieces of steel in it, put in the top, and lute with fire clay. Heat it in a slow fire to a red heat, then take out and let it cool off.—J. H., of Md.

GAS IN WELLS.—Being much troubled some time ago with a foul well, down which it was necessary to send men to repair a pump, all other remedies having failed, I found the following treatment a perfect success: Having attached one end of a common hydrant hose to a steam boiler, I ran the other nearly down to the water, and blew the well full of steam. It soon condensed, with the aid of a little water sprinkled down, and having displaced (or perhaps absorbed) the carbonic acid, the air was perfectly purified. In the absence of a steam boiler, probably as good an effect would be produced by forcing air down through the hose, with a common force pump or otherwise.—O. S., of N. J.

BLOWING OUT BOILER.—D. & N., query 21, March 9, had better let the water cool in their boiler, and then let it out and wash with cold water. Query 30: They will see that it is not right to wash a hot boiler with cooler water. The consequences might be fracture by irregular contraction.—S. F., of Pa.

ANTS AND MOLES.—Query 20, March 9.—For ants, place a fresh meat bone where the ants can get at it, and they will flock to it in large numbers. When they are on it, dip it in hot water; repeat it a few times and the ants will have disappeared. For moles, dig a hole like a post hole across one of the mole holes, and in the bottom, place some rags previously dipped in sulphur. Set fire to them, and, when once well on fire, cover up close with a board, and the mole hole acts as a pipe. The mole leaves.—A. M., of Ky.

PREPARATION OF NITROGEN.—Professor A. W. Hoffmann, of Berlin, recommends the use of nitrite of ammonia for the preparation of nitrogen gas. It is only necessary to heat this salt when it is decomposed into nitrogen and water, thus:



The nitrite of ammonia is very easily prepared from nitrite of potassium and chloride of ammonium. The nitrogen prepared in this way is very nearly pure, the only contamination being a little nitrous oxide, a gas very soluble in cold water.—E. J. H., of —.

TEST FOR NITRIC ACID.—P. C. H., No. 19.—The most delicate test is brucine, which is said to indicate one part of nitric acid in 100,000. One part of brucine is dissolved in 1,000 parts of water. To half a drop of the solution to be tested, add one or two drops of the brucine solution, and from one to five drops concentrated sulphuric acid. Sulphate of anilin will detect one part of nitric acid in 1,000 parts of water. To the solution to be tested, add two drops sulphate of anilin and from two to six drops concentrated sulphuric acid. The ordinary laboratory test is to place, in the test tube containing the solution, a crystal of copper or sulphate of the protoxide of iron. One or two drops of strong sulphuric acid are then allowed to run down the side of the test tube to the bottom of the liquid; and this sets free the nitric acid, and this in turn oxidizes the iron, forming a dark brown ring or zone.—E. J. H., of —.

ELASTIC CEMENT.—No. 10, March 16.—Dissolve one dram of gutta percha in one ounce or more of bisulphide of carbon, so as to make a fluid that will easily pass through coarse filtering paper. After filtering, add about fifteen grains of pure india rubber, and let it dissolve; or, when it has become soft and gelatinous, quickly rub the whole smooth with a palette knife on a slab. Paint four or more coats of this varnish over and around the hole in your bag, allowing each coat to dry before the application of the next. Treat a piece of fine strong calico in the same way. The last coat on each should be pretty thick, and when nearly dry, apply the patch to the bag, and press evenly and quite firmly together. When at last the whole is supposed to be dry, press with a warm iron, and then paint the surface of the new piece with a coat or two. If nicely done, your bag will be as strong as ever. Chloroform may be used in place of the bisulphide.—E. H. H., of Mass.

FLUID AND LIQUID.—No. 2, March 16.—These are practically synonymous terms, and I would venture the following definitions, even if they appear far fetched: Liquid, a form of matter allowing of perfect mobility of particles or atoms. Fluid: a term whereby we may imagine the perfect mobility of the particles of matter not ordinarily visible. Thus we speak of water as a liquid. But carbonic acid gas we might speak of as a gaseous fluid, since in pouring it from one vessel to another, it may, under certain arrangements, be seen to flow, and comport itself much in the same manner as when pouring water. Its particles are perfectly mobile. We speak metaphorically of the electric fluid, as the term there again conveys to the mind the impression of mobility, and thus its condition in passing along or through a wire. This I give as a popular illustration, not that such a theory is by any means correct. E. H. H., of Mass.

CLEANING DISCOLORED GLASS.—Query 16, March 16.—I have frequently cleaned glass that appeared smoky, when soap, turpentine, alcohol, or scouring with whiting would make no impression on it, by applying dilute nitric acid.—W. G. B., of Mich.

FAST COLORS.—Query 8, No. 12.—A dye of logwood an blue vitriol is made fast by wringing out the goods in a solution of blue vitriol and then plunging in a hot solution of logwood. After sufficient coloring, dry and air the goods one day; wash them in soapsuds until little color escapes; then immerse in cold urine and bring to a boil, leaving the goods to cool in the urine. Remove and wash thoroughly in soapsuds, rinsing in clear cold water. It is of the utmost importance that the goods be absolutely clean before coloring commences.—W. D. P., of Wis.

Declined.

Communications upon the following subjects have been received and examined by the Editor, but their publication is respectfully declined:

ATMOSPHERIC ELECTRICITY.—G. W.

BOILER EXPLOSIONS.—J. M. H.

CANAL BOAT PROPULSION.—

FORCE.—S. H. T.

RIFLES.—G. W. T.

SCIENCE IN THE COURTS.—ALEX.

SHAVING WITH PUMICE STONE.—A. K.—R. B. F.

SMALL POX CURE.—J. H. V.—A. M. L.

SOLAR PHENOMENON.—C. S. M.

SPIRITUALISM.—E. G. J.

THE DAVENPORT BROTHERS.—F. J. I.

WATER WHEEL TESTS.—S. & S.—L. B. A.

ANSWERS TO CORRESPONDENTS.—G. W.—J. E. M.—C. H. W.

—J. T. B.—L. H. & Co.—L. H. S.—P. D. W.—J. F. A.—

J. G. W.—G. A. B.—C. T. T.—D. H. B.—J. L.—C. G.—

H. F. R.—J. L. G.—G. A. H.—T. H. J.—A. H. N.

NOTES AND QUERIES.—J. A. Y.—S. T. W.—J. S. D.—C. L.—B.

—P.—M. C. W.—N. Y.—G. E. P.—S. H.—J.—M. P. B.—

D. H. B.—P. C.—J. D. J.—J. H. P.—M. S.—C. W. A.—

T. V.—Q.—J. G.—F. M. G.—T. H. J.—R. H.—J. K. C.—

M. A. R.—W. L. H.—A. M. B.—B. F. A.—W. M. D.