

# Notes & Queries

## ANSWERS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at the office. Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) G. H. W. asks: Will you kindly answer the following questions through your Notes and Queries column? 1. Will the dynamo described in SUPPLEMENT, No. 161, work two of Edison's smallest incandescent lamps if the magnets are excited by a strong battery? A. Yes. 2. What kind of cast iron should the armature of the dynamo be made of? Will ordinary cast iron do? A. Soft gray iron. 3. Will No. 19 copper wire be too small to make the connections with the lamps? If too small, what size should be used? A. No. 14 or 16 would be better.

(2) J. G. R. writes: I have a set of yellow clarinets that I wish to stain black. Can you tell me of anything that will do it? A. Mix up a stain of iron sulphate (or copperas) and logwood, to which add powdered nutgall; dry, rub well, polish with a shellac varnish ground with bone black.

(3) S. H. H. writes: I have seen in the SCIENTIFIC AMERICAN articles about compressed lime for blasting. Can you inform me where it is to be had? A. Use ordinary lime; press it tightly into the opening, and then moisten it. Its expansion will cause the blast.

(4) F. J. P. asks whether there is any fluid of substance which when it touches paper will eat the paper and when the fluid is exhausted comes in contact with it. A. Caustic potash or concentrated sulphuric acid will probably accomplish your purpose.

(5) L. L. asks the best way to prepare diamond cement for repairing cracks in a cistern. A. On page 2114 of SCIENTIFIC AMERICAN SUPPLEMENT, No. 133, are given the directions for preparing several varieties of cement which we think you will find as good if not better than diamond cement for the purpose mentioned. Diamond cement as described by Dr. Ure consists of isinglass, 1 ounce; distilled water, 6 ounces; boil to 3 ounces, and add rectified spirit, 1½ ounces; boil for a minute or two, strain, and add while hot a sticky emulsion of ammoniac half an ounce and then tincture of mastic 5 drachms.

(6) C. W. writes: The river at this place is a mountain stream having a fall of from 14 to 20 feet per mile, but is free from cataracts; it is about 100 feet wide and of sufficient depth for a light draught steamer such as is described on page 132 of your Reference Book. What I wish to know is this: 1. Can a steamer of this description navigate such a stream when not drawing more than 12 inches of water? A. You do not give the velocity of steamer, but we think from the grade, or fall, it must be too great to work a steamer against it successfully. 2. Which would be the best for such a boat—a stern wheel or a propeller? A. Stern wheel boat the only one that would succeed. 3. What would be the weight of such an engine and boiler as you describe? A. The boat must have large power; the weight would of course depend upon the size of the boat and power.

(7) J. C. W. asks: 1. Cannot water be elevated with less power by chain elevators than by pumps? A. We don't think your chain buckets will require less power than a pump. 2. Can chain elevators be made sufficient to carry buckets 4 feet long containing 2 cubic feet to the bucket, the buckets being as close to each other as they can work, and deposit in a box on a perpendicular, or will they have to be on an incline? The box will be so arranged that the buckets can go over them and will be 40 feet high. About 65 buckets will be deposited per minute. Will this not be cheaper than a pump, and easier to be driven? If so, how much power will it take to run same? A. If the buckets and box are properly shaped the buckets will deliver with some waste, but there should be an additional box between the two lines of buckets to catch the water that may spill or waste from the buckets when going over the top shaft. It will require 12 to 18 horse power.

(8) W. S. C. asks (1) where a tightener should be placed on a belt—near the small or drive pulley? A. Near the small pulley, as it will give more surface for belt to act upon, and the large pulley has already much the most surface. 2. Mill men differ about the same. Therefore I wish to get your opinion; at the same time will you be so kind as to give as simple a rule as possible for finding the horse power of steam engines? A. For rule for ascertaining horse power, see SCIENTIFIC AMERICAN SUPPLEMENT, No. 253.

(9) E. T. H. writes: You give a recipe for marking ink (I have lost the reference) of shellac 2 ounces, borax 2 ounces, water 25 ounces, gum arabic 2

ounces, and Venetian red. Could you give me a modification which would make it suitable for marking through stencil plates, for which this is too thin? Have tried your liquid stove polish, and find it first rate, but very hard to polish. Is it likely that the sugar is in excess? A. 1. By adding glycerine to a suitable consistency, you will obtain an ink which will probably answer your purpose. 2. As you give no proportions, your question cannot be satisfactorily answered. The proper amounts are:

Black lead pulverized..... 1 pound.  
Turpentine..... 1 gill.  
Water..... 1 gill.  
Sugar..... 1 ounce.

(10) W. J. P. asks: Will a balance wheel run as easily close to the floor under a machine as above it? A. There should be no appreciable difference.

(11) C. R. S. asks: What is the best method or way to "lay up" a tubular boiler—horizontal—when not in use, say six months at a time? A. Fill entirely with fresh water, adding a little lime, and close tight. Clean outside, remove all masonry which touches the boiler, and oil with fish oil. Close opening to chimney, so there will be no draught through it.

(12) C. E. L. writes: 1. Watson says in his work on the modern practice of American machinists and engineers, that the steamboat John Faron on the North River had boilers made to use the fuel inside the water space of boiler. How did they have it fired so as to be able to burn the fuel? A. The furnaces were made tight and strong, air forced into fire under a pressure, a little more than the pressure of steam in the boiler; all the gases, etc., of combustion thus forced through a valve into the boiler, fired through valves. 2. Would you use an ordinary steam engine for compressed air, or would you have one made to run by air? A. Steam engine. 3. How large a reservoir would be necessary for about 4 horse power? Could it not be made of cast iron? A. Should be wrought iron. Could not determine size without knowing the length of time through which it is to work 4 horse power.

(13) O. J. L. asks: Can the ordinary water white 150° fire test coal oil be changed in color to an indigo blue or any other shade of blue without lowering the fire test? If it can be done, by what method is it accomplished? A. The fire test will not be affected by the adding of suitable dye, such as an aniline color, of the desired shade to the oil. Of course, one must be selected that is soluble in petroleum.

(14) J. A. T. writes: 1. How can I make a liquid for stripping silver from old plated ware? A. Use nitric acid to dissolve the silver. 2. How can I recover the silver from the stripping liquid? A. The nitric acid solution containing the silver is treated with a salt solution; the metal is then thrown down as the chloride in the form of a white powder. This is collected and fused with borax, and the silver will be obtained in its metallic form. 3. How can I make an induction coil for an electric machine? A. Consult article on "Induction Coils" in SCIENTIFIC AMERICAN SUPPLEMENT, No. 160. 4. Will the stripping liquid for silver answer the same purpose for gold plate? A. Use aqua regia or nitrohydrochloric acid to dissolve the gold.

(15) D. H. asks: What is the best thing to prevent glucose made from corn from coloring under heat? A. We know of nothing that will prevent the sugar coloring when heated. The best way in which to avoid the coloring is by boiling it as quickly as possible in a vacuum at a temperature of 125° Fah. If in an open pan, boil with steam. A certain amount of coloring is sure to be developed.

(16) O. S. D. asks: 1. Will a boiler 42 inches in diameter and 60 inches high run two cylinders 7x10 to the capacity of 14 horse power, 120 2-inch flues 3 feet long? A. If your boiler has a good draught, it should furnish 14 horse power without trouble. 2. What is traction resistance of 4 wheels 6 inches face 4 feet in diameter? They have movable lugs, that project through the face or rim of wheel, 3 inches wide and 2 inches deep. Will the resistance be as much as four 16 inch plows plowing 5 inches deep? A. The traction will in a measure depend upon the weight carried by the wheels, but for working an ordinary soil we think your wheels have not more than half the force they should have, and the lugs should also be increased in proportion. We cannot tell what power four 16 inch plows require, for different kinds of soil.

(17) G. W. D. writes: I am using a No. 9 Sturtevant fan blower. Can it be run too fast, so that it will not blow as hard as it would if run at a slower speed? What size engine should I use to get the best results from this fan, for glass manufacturing purposes? A. Your No. 9 Sturtevant blower at a speed of 1,035 turns per minute will deliver 4,320 cubic feet of air per minute, under a pressure of 4 ounces, requiring 6 horse power. At 1,250 turns per minute it will deliver 5,340 cubic feet of air at a pressure of 4 ounces, requiring 11 horse power. At 1,416 turns, 6,180 cubic feet, requiring 17 horse power, and so on. There is no speed that you can give the blower that it will not do its proportional duty. If it ceases to blow or deliver air at high speeds, it is because of obstruction, possibly at the tuyere.

(18) J. C. H.—It is rather a difficult undertaking to choose a trade for a person that is a perfect stranger to us in his capabilities, habits, and previous employment. If you have a fancy for any particular calling, we should say that that is the trade you ought to follow. The employment of a machinist is probably as lucrative and steady as any trade that we know of, and is a leader to many other callings that may take you on to success. Of course you will probably have to begin at the bottom and do a great deal of drudgery, but if you are a wide awake man and have your eyes open to the things that are being made around you, and make the interest of your employer your own, the chances are entirely in your favor for quick advancement. Strike in at the nearest machine shop, a small one if possible; take any wages that you can get, do not be particular, get to work, and you will get ahead.

(19) D. D. L. asks: What will best remove smoke from the sheets of mica commonly used in heating stoves, and leave the surface clear? A. We doubt whether mica can be cleaned after it has been exposed to the smoke of a stove, other than by washing with warm soap suds and wiping. The pyroigneous acid of the smoke makes new compounds with the surface layers of the mica. The mica being composed of silica, alumina, magnesia, and potash, will not resist heat or acids strong enough to destroy the carbon or its coloring matter without making the mica opaque or otherwise destroying its texture.

(20) M. M. B. (62) November 10 concerning treatment of seal skins.—M. C. H. writes us that a large business is now done in Brooklyn, N. Y., in curing, dyeing, and improving seal skins, the work done being equal to the best imported work.

(21) J. A. C. writes: Suppose we have two cylinders of the same size. In one cylinder there are two pistons working together, at the center, and the cylinder with one piston working from end to end; which engine would have the most power—the one with the single piston or the one with the double piston? Or would they both have the same power? Steam pressure the same on both cylinders. A. The one with single piston would have more power, as there would be less loss from radiation, clearances, and friction.

(22) F. T. J. writes: I have a small engine cylinder 2 inches by 4 inches that I work at about 50 pounds boiler pressure; boiler has about 90 or 25 feet heating surface, perhaps more. I want to do away with steam on account of the fire. Can I pump air into the boiler (to insure steady running of engine) by hand, and work engine at same pressure, and obtain same power as by the use of steam? A. No, your power would be limited to the power of the man pumping in the air. We think a small turbine, taking water from your water works, would be the most convenient and economical power for you.

(23) G. B. F. asks: What is the cause of knocking in an engine? Is it not a defect or fault that should be remedied at the earliest notice? A. There are many causes—bad set of valves, loose journals or piston, water in cylinder, no clearance, etc. The cause should be ascertained and remedied, otherwise it may lead to an accident.

(24) R. J. H. asks for a recipe for removing printer's ink from nicely finished book paper; he wishes to remove some figures from a catalogue. A. Printer's ink is soluble in ether, oil of turpentine, and benzine. Washing with warm caustic lye is also recommended. Bleaching agents are also stated to accomplish this object, but we do not put much faith in any of these agents.

(25) A. M. V. asks (1) for a receipt for sensitive ink. I would like one (if possible) which is developed in some other manner than by heat, and which after being developed with appropriate developer, until redeveloped. A. On page 2498 of SCIENTIFIC AMERICAN SUPPLEMENT, No. 157, will be found a number of receipts for various colored sensitive inks. 2. A receipt for an ink, to be used with a rubber stamp, which will not wash out of clothes. A. Crystallized aniline black, half an ounce, in pure alcohol, 15 ounces, and adding concentrated glycerine, 11 ounces, to the solution. This liquid is poured upon the cushion and rubbed with a brush.

(26) W. C. D. asks what is the safest lamp. Glass flies or bursts, and metals corrode. In other words, how can we use oil to illuminate our homes and be safe? A. The best fire test refined kerosene oil in a student lamp is one of the safest lamps that we know of. Our better class of ordinary kerosene lamps with fair care are considered safe. If you reject all oil that does not stand 150° fire test, you will be very safe with the better class of kerosene burners with chimneys.

(27) A. E. D. asks whether the wood called "Spanish cedar" would make a good body for a violin. A. The body of violins is usually made of straight grained deal. 2. Is there any solution which will make white cows' horns become clear, the horns to be used for making powder horns? A. Boil the horns in a dilute solution of caustic alkali.

(28) E. A. W. asks how to mix quicksilver (mercury) so as to make a thin solution of it to rub on metal. A. The amalgam of silver commonly used is prepared by putting one part of silver in a small saucpan or ladle which is perfectly clean, and then adding eight parts of quicksilver and gently heating until the silver is dissolved. Agitate the mixture for a minute with a smooth iron stirrer and pour it out on a clean plate or stone slab. When solid it is ready for use. A saturated solution of mercury dissolved in nitric acid is also used for this purpose.

(29) J. H. writes: 1. My wife is accustomed to make her own soap for family use, from old fat, lye, soda, and salt. It is very good, but never seems to get really hard. It is always soft and pulpy. Please to inform me what will harden it. A. A good way to make soft soap hard is as follows: Put into a kettle four pails of soft soap, and stir in it, by degrees, about one quart of common salt. Boil until all the water is separated from the curd, remove the fire from the kettle, and draw off the water with a siphon (a yard or so of India-rubber tubing will answer); then pour the soap into a wooden form in which muslin has been placed. When the soap is firm turn it out to dry, cut into bars with a brass wire, and let it harden. A little powdered resin will assist the soap to harden and give yellow color. If the soft soap is very thin, more salt must be used. 2. What is good to clean tableware that has been nickel plated, and the plate is worn off and looks quite brassy? A. We should think that it would be best to renickel the articles.

(30) J. M. describes a machine and process of amalgamating and separating silver from the ores, and asks: 1. If I can use other cheaper salt than sulphate of copper that gives the same good results. (Lead amalgam does not work well with some kinds of ores.) If there is any other, please tell me how to prepare it and how to use it. A. There is no salt that can be used that is cheaper than the copper sulphate.

2. How can I retake the flour mercury and make it useful again, or how can I avoid the mercury taking this form in the barrels? A. We would recommend that the flour mercury be redistilled, and that the metal be covered with a layer of clean iron filings or turnings to the extent of one-sixth its weight. Then carefully heated and the mercury collected in water, treated with a little hydrochloric acid, and finally washed with water and dried at a gentle heat.

(31) C. J. W. asks: 1. Have antimony and bismuth a metallic ring like brass? A. Antimony and bismuth have more or less of a ring, but on account of their brittleness they are seldom made into forms where the ring would be noticed. 2. How do their weights compare with that of gold? A. The specific gravity of gold is 19.36, of antimony, 6.71, of bismuth 9.82. 3. How does quicksilver weigh with gold. Is it much lighter? A. The specific gravity of mercury is 13.59. 4. Where can I get a book on photo engraving? A. See SCIENTIFIC AMERICAN SUPPLEMENTS 82, 213, 143, 146, and 227 for Photographic Engraving Processes, and see advertising columns.

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

W. R. S.—The samples do not contain copper or nickel except in possibly small amounts, and in order to definitely prove the presence of either; they would have to be analyzed, the expense of which would be \$5 each. From our examination we believe the specimens to be one of the varieties of pyroxene or epidote. The latter is frequently found in connection with the copper at Lake Superior.—G. B. F.—The specimen is a clay, or silicate of aluminum. Its value can only be determined by analysis. The latter would cost \$15.00.—J. C. R.—It is impossible to form a definite opinion of the value of the clay unless a chemical analysis be made, which would probably cost \$15.00 to \$25.00.—C. J. V.—The specimen is nickeliferous iron pyrites. Its value depends upon the amount of nickel that it contains; and as the extraction of the latter is an expensive operation, the value of the ore is reduced accordingly.—T. H. S.—The sample is what is known as turba, or turfa, and is a clay impregnated with bitumen. It has been described in Dr. Hart's book on Brazil.—P. J. F.—Sample No. 1 is a slate, such as is generally found in coal measures, but does not necessarily imply the presence of any great amount of coal. No. 2 is a black mica in a silicious rock.—C. N. N.—These five samples are simply a series of clays whose color depends upon the metallic oxides with which they are colored. The yellow and red shades are due to oxide of iron.—H. A. B.—The sample is pyrite (iron sulphide), and may carry gold. To determine the latter, an assay costing \$5.00 would be necessary.—W. R. A.—The sample is pyrite (iron sulphide), and may carry gold. To determine the latter an assay costing \$5.00 would be necessary.

ERRATUM.—J. H. W. In answer to Query (8) December 1, 1883, gallon should read cubic foot.

## Business and Personal.

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