Business and Personal.

The charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(3860) A. T. S. asks: 1. In transferring pictures from paper to wood for re-engraving by the mode described in Moore's Universal Assistant, page 547, I find that it destroys the colored inks, leaving the paper plain, with nothing to transfer except the black, which seems to work all right. What is the reason, and is there a way to do this? A. You might try the varnish tranferring process. Varnish the block, soak the print in water. While the varnish is still tacky, smoothly rub on the print and let it dry. Then rub off the paper with the wet finger. 2. On page 551 same book, under the heading "To print a picture from the print itself," what form of potassa is meant? I could not make it work with caustic potassa. Does it need any particular kind of ink? I used common printer's ink. A. Use lithographer's ink. Caustic potash is meant. To three parts solid tartaric acid use one part caustic potash. In our SUPPLEMENTS you will find many processes of photographic reproduction described. These are the most reliable and generally used methods. Photography is also extensively used to reproduce a picture on the block for engraving.

(3861) E. H. says: My radiating steam coil showed some new feature—new to me. Having occasion to open valve under supply tank, the steam with condensed water, instead of blowing out, went direct back into boiler, making a roaring noise. There was 5 pounds pressure at the time. Can you explain? A. Your boiler had a partial vacuum instead of a pressure of 5 pounds. Your gauge must have been out of order. Boilers used for low pressure heating with a closed return circulation often have a vacuum when the steam goes down, because the condensation is greater than the supply from the boiler. 2. An inch pipe set vertically filled with water, will give how much pressure at bottom, height 60 feet? A. The pressure at bottom of pipe will be 25·8 pounds per square inch.

(3862) W. W.—The article to which you refer states that the roots of *Abrus precatorius* "afford licorice, which is extracted in the same manner as that from the true Spanish licorice plant, the *Glycyrrhiza glabra*." The Spanish method of making extract of licorice is as follows The roots of the *G. glabra*, after having been dug up, thoroughly cleaned, and half dried by exposure to the air, are cut into small pieces, and boiled in water till the liquid is saturated. The decoction is then allowed to rest, and, after the dregs have subsided, is decanted, and evaporated to the proper consistency. The extract, thus prepared, is formed into rolls from five to six inches long by an inch in diameter, which are dried in the air.

(3863) S. B. asks: 1. What is the rule for determining the increase of speed or force of discharge from the nozzle of a pipe, in accordance with its decrease in diameter, from the main pipe? A. The relative height of a jet from a nozzle increases with its size, with the same pressure at the butt. When a pipe or hose intervenes, the relative height depends upon the friction in the main pipe and hose, and also upon the kind of surface on the inside of the hose. The subject is fully explained, with tables of loss of head by friction, and the height of jets for given pressures, in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 791, 792. Also in Ellis' work on "Fire Streams," $1.50 mailed. 2. Is air in motion, *i. e.*, wind, colder than when at rest, comparatively? A. Air in motion is not necessarily colder than when at rest, but has more power to absorb or carry away heat from the body by convection, or by a more commonly expressed term, wiping the heat away. It also greatly assists evaporation of moisture from the body, with consequent chilling.

(3864) T. J. H.—If, as you say, you have a great deal of leisure time at your disposal, and wish to study pharmacy, we would advise you to make an arrangement with some pharmacist of your town whereby you can spend a few hours a day in his store to obtain practice and instruction. Good books for you to read would be the "United States Dispensatory" and "Parish's Practical Pharmacy." We can furnish you with the former at $8.00 and the latter at $6.00.

(3865) J. H. D. writes: 1. Is acetate of soda a costly product? A. No. 2. After having absorbed water, does it generate a great degree of heat? A. No. 3. Can it be used more than once? A. Yes. 4. Does it evolve a gas while generating heat, and if so, what kind? A. No gas is evolved. The action of acetate of soda (sodium acetate) is based on the doctrine of latent heat. The salt, if heated, dissolves in its water of crystallization. In the heating process it becomes warm enough for use in foot warmers, etc. Then, as the temperature falls a little, the salt again solidifies, and gives off its latent heat of fusion, thus prolonging the period of usefulness.

(3866) G. O. S. writes: 1. In regard to the dynamo described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 600: According to the author, it is an eight-light dynamo; could it not be used on one light of 8 times the power? A. The dynamo may be run in the manner proposed. 2. What changes, if any, would be necessary to use it for plating purposes, and would it work well as a plater? A. For changes required to convert the dynamo into an electroplating dynamo we refer you to SUPPLEMENT, No. 793. 3. Can you inform me where I can get a book which teaches all about brazing, the blowpipe, etc.? A. You will find instructions on brazing and soldering in SUPPLEMENT, Nos. 20 and 187.

(3867) J. C. C. asks: 1. Is there any theory as to why the sun and moon appear larger near the horizon than elsewhere? A. The theory of the apparent enlargement of the sun and moon at the horizon is that their light passes a greater distance through the atmosphere than at higher elevations. This causes an increased refraction, tending to enlarge the solar and lunar image, and acting as a great spherical lens at a near distance at noon and a greater distance at the horizon. 2. Why is there no dew on the morning of a cloudy night? A. Dew is caused by the radiation of heat into space during clear nights. This is prevented by clouds, which act as a great blanket, tending to retard radiation. The cold earth surface induces condensation from the moist air in the form of dew, much as an ice pitcher condenses the moisture of the air upon its cold surface. 3. Is it true that there has recently been discovered an element lighter than hydrogen? A. No.

(3868) C. Y. says: An argument arose as to the value of a silver dollar, that is, the intrinsic value of the component parts at the time of issue. A. The present value of the silver dollar is 73·8 cents in gold, the price of pure silver bullion being 95½ cents per ounce in gold. There are 371¼ grains of pure silver in a dollar, the ounce being 480 grains. The quotation of silver bullion at 1·292 per ounce is based on the value of the pure silver in a dollar.

(3869) T. T. asks: Can you inform me how to clean the slime and filth from a waste pipe that carries off soapy water from a wash sink? It is 1¼ inch iron gas pipe and cannot be got at, only at the inlet and outlet. Is there a chemical that will do the work? A. If the pipe is entirely closed, there is no chemical that will open it, but if there is still an opening through it, a hot solution of lye poured into the pipe may clear it out. This preparation comes in pound packages and can be bought at any grocery. If the pipe is closed, and you could work a wire through so as to run in the lye, it might do the business. True caustic potash is far superior to the "lye" sold in the groceries. The name "caustic potash" is often printed on the labels of packages of caustic soda. You must get the real potash at the drug stores.

(3870) H. C. W. asks: How to braze band saws, with fine brass wire, and hot tongs, the best kind of acid, and how to place the wire between the joints, how hot to get the tongs so as not to burn the saws? A. Use the thinnest sheet brass or silver, about No. 30 wire gauge, for brazing band saws with hot tongs. Scarf the broken ends ¼ to ⅜ inch back and lap ½ an inch with a slip of the thin brass or silver between, well boraxed by rubbing the borax on the surfaces and add a little powdered borax to make sure. Fix the ends of the saw in a forked frame or block of wood by clamps in its proper position, so that it can easily be gripped by the tongs. Make the jaws of the tongs so that they will close fairly upon all parts of the lap. Heat to a bright cherry red and apply quickly and carefully; hold until the solder is fused; squirt a little water between the jaws to set the joint, when the tongs can be taken off. The extra thickness made by the lap should be carefully filed to gauge thickness, and if a kink is made, it may be straightened by hammering on a face-block.

(3871) G. R. F. writes: The following is a way to wind the uncovered wire on the secondary coil in an induction bobbin by hand, as not all amateurs have the opportunity of using a lathe, according to Hopkins' "Experimental Science," and which I found easy enough. Procure cotton thread a little thicker than the size of the wire, winding it together with the wire on the spool, taking care that the thread and wire do not get twisted together, but run on the spool one parallel to the other, so that the cotton thread will always keep the two adjacent wire spirals on the spool separate. A little crank made of three pieces of wood, to turn the bobbin, will do for the lathe. I used olive oil to dip the cotton, before using it, in varnish or shellac.

(3872) F. W. S. asks (1) if an oil atomizer will do for soldering as well as a gas blowpipe. A. An oil atomizer is not suitable for an ordinary blowpipe; there is no control over the blowpipe flame. 2. If brass can be soldered to cast iron, and what is the best solution to use? A. Brass can only be soldered to cast iron by first cleaning and tinning the cast iron surface, which must be made clean and slightly rough with a file and tinned with a copper, using sal ammoniac on the copper and iron with pure tin. If the iron is large, it should be heated other than by the copper.

(3873) H. B. L. asks whether or not there is a metal or composition that is black all through. Can phosphor bronze be made black? A. Black is due to the incapacity for reflecting light. No metal can be said to be truly black. Bronze is not black, and cannot be made really black except by some superficial treatment. Unpolished planed cast iron is often nearly black, owing to graphitic carbon contained in it.

(3874) J. E. A. writes: What is the best poison for poisoning wolves? I have been using strychnine, with poor success; they detect the poison, and will not eat meat that contains it. A. Strychnine is the generally accepted poison. You may not conceal it properly. Insert it in gashes or within lumps of meat, so that the meat will be eaten without the bitter taste being perceived.

(3875) A. M. writes: I see large amounts of celery which do not appear to be whitened in the usual manner by blanching, but is white all over as if by some bleaching process. Please can you inform me through next paper what is that process? A. No process is used beyond the ordinary blanching by covering with earth. Boards are sometimes placed roof fashion over the tops. The variety of the celery may have something to do with it. There is what is known as self-bleaching white plume celery, which gives very white stalks.

(3876) C. S. B. asks: How are torpedoes made? Such as used by children on the 4th of July. A. By inclosing a little fulminate of mercury mixed with gravel in tissue paper twisted up as nearly spherical as possible.

(3877) M. L. M. asks: How many horse power would an 18 foot overshot wheel give with 50 miner's inch of water running on it? Also what would 100 miner's inch of water running on it give? A. 2⅛ horse power and 5¼ horse power.

(3878) F. G. B. asks: Will you please tell in your answers to correspondents of a simple method for determining whether water from a driven well is fit for drinking and cooking purposes, and can be used in a steam boiler to run an engine without injury to the boiler? A. There is no simple way. If the water is placed in a glass and some white sugar is dropped into it and all is left at rest, the appearance of a colored deposit near the little pile of sugar is supposed to indicate a bad water. But the water can be bad without this happening. For boilers the addition of three volumes of alcohol should produce no precipitate (calcium sulphate), and on boiling no precipitate should appear (carbonates). These tests are also far from complete.

(3879) H. M. W. asks: 1. Is it possible to burn water? That is, to decompose it into inflammable gases so suddenly that it might be said to burn. If so, how is it done? A. Water can only be decomposed into hydrogen (inflammable) and oxygen (non-inflammable). Burning, in general terms, is the combination of an inflammable with a non-inflammable gas. Therefore water cannot be burned. Its decomposition is the exact opposite of burning. 2. Are there any furnaces where a temperature of 3,000° Fah. is attained? A. Undoubtedly this temperature is attained in many blast furnaces. It is probably vastly exceeded in the electric arc, and in oxyhydrogen gas furnaces.

(3880) H. W. B. writes: A crew can row at the rate of 12 miles per hour in still water. It takes them 7 hours to row up a stream a certain distance, and 5 hours to go down a certain distance; at what rate does the stream flow? A. Let x=rate of stream. Then from the conditions of the problem we have: $7(12-x)=5(12+x)$, and solving $x=2$ (miles per hour).

(3881) B. H. says: Please explain through your columns your reason for answer to query 3690. I would also like to hear opinions from people who have used the cure. A. Singeing is now used in barber shops, and as a source of income any new fad is favored, even if a bald head gets burned. We have no experience.

(3882) G. M. asks (1) how to make a small balloon rise in the air. A. By filling it with coal gas or with hydrogen. 2. Will common gasoline do? A. No. 3. Will a pump be needed to pump the gas into the balloon? A. If the balloon is of India rubber, pumping is needed to cause it to expand; but with ordinary cloth balloons no pumping is needed, the pressure in an ordinary gas main sufficing.

(3883) G. V. says: I have a grain crusher with two cast iron rollers. They have a few small holes, air holes I would call them. Of course grain when passing between the rollers is not crushed when opposite the holes. Is there a composition or cement they can be filled with? A. There is no cement that will stand the wear. Drill holes a little larger than the blow holes, fit iron plugs that will drive snug to the bottom, wetting the plug with a solution of sal ammoniac in water. Finish the top of the plugs even with the surface of the cylinder.

(3884) H. M. R. asks: Can you inform me in what shape rye bread is used to clean wall paper? I have seen some work done with it and am anxious to learn how. A. Use the soft inner portion of the bread. It should be applied to the wall with a rolling motion.

(3885) S. C. asks: We have tried, for the removing of typewriting from paper, your suggestion (3533) to M. B. K., in your paper of October 24. All your remedies failed. So could you tell me something else? A. Try javelle water or alcoholic solution of caustic potash. Success is very doubtful.

(3886) C. H. H.—Glass will expand and contract under changes of temperature.

(3887) G. H. W. asks: Which is the more necessary for a mechanical engineer, machine shop practice or foundry practice, where only one can be had? A. Machine shop practice is most essential in the education of a mechanical engineer. Foundry practice not so much so, yet is sometimes a great help as a guide in constructing patterns for machinery.

(3888) E. P. H. asks: Is the lateral pressure greater on a stand pipe 1 foot in diameter filled with water and 100 feet high than on a pipe 1 inch in diameter and same height? A. The pressure is no greater per square inch of surface for a given height, whether the pipe be large or small. The strain tending to rupture or split the pipe increases with the diameter, or is 12 times greater in the large pipe, as above stated.

(3889) C. E. H. says: We would like to ask if you can tell us why the water drawn from our hot water spigot should have a milky white appearance When it is first drawn the discoloration is very marked, but after it is allowed to stand a few minutes it becomes perfectly clear, excepting that at times we can discern small white sediment in the bottom of the vessel. We use Philadelphia city water and our plumbing consists of lead pipe throughout. We have a galvanized iron circulating boiler and we notice that it is only the hot water, that is the water which has passed through this boiler, which is discolored. Can you tell us the cause of the trouble and suggest a remedy? Also would this water be injurious to health if used for cooking purposes? A. The sediment from the hot water faucet may be oxide of zinc, derived from the zinc in the galvanized iron boiler. Clean out the boiler thoroughly, which may stop it. There is some danger of poisoning. The only remedy is to put a copper boiler, tinned upon the inside, in place of the galvanized iron one.

(3890) M. A. R. says: I wish to find out more concerning bismuth than can be found in the encyclopedia, of the commercial value, the supply and demand, both here and abroad, the uses, etc.? A. The supply of bismuth is limited and derived mostly from Germany, with small quantities from England, Norway and Siberia. It is largely used in type metal, and in the arts. Present price $2.40 per pound. It is not yet mined in the United States, although known to exist in Utah, Colorado, Arizona, California, and Alaska. The localities discovered do not assay in paying quantities at present. Books on chemistry treat of the chemical relations only.

(3891) G. H. asks how to construct an armature for electro-plating to fit in the same place of the eight light dynamo as described in SUPPLEMENT, No. 600. I have got the dynamo all complete, including the armature, but I want to make an armature to slip in its place for plating. Please state size of wire, number of coils, number of layers in each coil, number of convolutions in each layer. Would an armature give best results as described in "Experimental Science," page 495? A. The information you require is given in full in SUPPLEMENT, No. 793.

(3892) L. D. asks: 1. Could I make an induction coil by following the instructions in SCIENTIFIC AMERICAN SUPPLEMENT, No. 160, if I use No. 36 double silk covered copper magnet wire and wind it straight across instead of using bare wire and winding it in sections? A. You could wind a coil in that way, but it would not be as efficient as one wound in two sections. The silk covered wire is better than bare wire. 2. What kind of wire would be best to use, that is, which will give the best results, bare wire, single or double silk covered, and how should it be wound? A. See answer to No. 1. 3. If I cover each layer of the secondary coil with one or two thicknesses of silk, would it not be as good as varnishing each layer? A. Silk is not as good as varnished paper for this purpose. 4. Would it not be better to make primary coil of four layers instead of two? If not, why? A. Two layers are better than four, as it allows the secondary wire to lie nearer the core and also permits of a greater number of convolutions of the secondary with the same length of wire. 5. If I make an induction coil with four layers of No. 16 wire for primary, and wind on for secondary coil to 3⅜ in. in diameter, No. 36 double silk covered copper magnet wire, straight across, would it give as good results as the one described in SUPPLEMENT, No. 160? A. No; see answer to No. 1. 6. About how large a spark would such a coil give? A. The coil described in the SUPPLEMENT referred to is capable of giving a spark 1½ inches long. 7. Would it do to have the same sized condenser and core in making such a coil? A. Yes. 8. How much wire would I need? How many pounds for primary, and how many for secondary coil? A. About ½ lb. for the primary and 2 lb. for the secondary.

(3893) C. E. B. asks: Who is the greatest electrical inventor? I say that Sir Wm. Thomson is the greatest, and H. says that Edison is the greatest, and T. says that Prof. Elihu Thomson. Now, which of these three great men have the most inventions that they have made by their individual selves. Also please answer the following: H. and T. say that the core of a magnet has electricity in it. I say it is magnetism, and not electricity. Please inform us on the matter. A. It