# 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 This is for our information, and not for publication.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.

(1) F. E. asks: If a piece of magnetic iron were dropped from a balloon several miles above the surface of the earth, would the magnetic attraction of the north pole attract the iron, or would it fall in a perpendicular line to the earth? A. Possibly the course of the falling body would be slightly affected by the magnetic attraction, but such pull would be very small compared with that of gravity.

(2) J. M. asks how to polish bullocks' horns. A. First scrape with glass to take off any roughness, then use pumicestone powder with a piece of cloth wetted until a smooth face is obtained. Next polish with rottenstone and linseed oil, and finish with a piece of clean linen rag. The more rubbing with the rottenstone and oil, the better the polish.

(3) K. S. S. asks: Is white clothing warmer to wear than black? A. For the same material black is warmer in sunshine and white during darkness.

(4) E. G. desires: 1. Receipt for making a good cosmetic. A. For black, use good lard 5 parts, wax 2 parts (or hard pomatum 7 parts), melt, stir in levigated ivory black 2 parts, and pour it into moulds of tin foil, which are afterward to be placed in paper sheaths. For white, the same without coloring matter. 2. Bay rum. A. Saturate a ¼ pound block of carbonate of magnesia with oil of bay; pulverize the magnesia, place it in a filter, and pour water through it until the desired quantity is obtained, then add alcohol. The quantity of water and of alcohol employed depends on the desired strength and quality of the bay rum. 3. Brilliantine. A. Take of honey 1 fl. ounce, glycerine ½ fl. ounce, cologne ½ fl. ounce, and alcohol 2 fl. ounces. 4. A good razor paste. A. Take of levigated oxide of tin, prepared putty powder 1 ounce, powdered oxalic acid ¼ ounce, powdered gum 20 grains, make into a stiff paste with water, and evenly and thinly spread it over the strop. With very little friction, this paste gives a fine edge to the razor, and its efficiency is still further increased by moistening it.

(5) S. E. L. asks the best and surest way to drill holes in chilled iron. A. A moderate chill can only be drilled by the hardest blunt drill with great pressure and very slow speed.

(6) N. P. K. wants a receipt for taking varnish off of furniture. A. Use a solution of about 3 pourds common washing soda to a gallon of water. Apply this to the work with a common paint brush, and after allowing it to stand for a short time the varnish can be removed with an ordinary stiff scrubbing brush.

(7) J. C. H. asks how to reduce over-intense dry plate negatives without the use of potassium oxalate. A. First immerse the negative in a concentrated solution of alum and citric acid (make a 10 ounce saturated solution of alum, let stand for a few hours, and add 1 ounce citric acid). The negative should be left in this solution for a quarter of an hour. If no reducing effect takes place, then wash and immerse the plate in a bath of:

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| Sulphuric acid | 1 oz. |
| Water | 20 oz. |

for about the same length of time. The negative will have a grayish color. 2. What is a good formula for ground glass varnish?

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| A. | Sandarac | 18 parts. |
| | Mastic | 4 " |
| | Ether | 200 " |
| | Benzole | 80 to 100 " |

3. A good cigar flavor. The following is one of many recipes said to be used in improving inferior qualities of tobacco: Comminute cassia bark, orris root, licorice root, angelica root, and rosewood, each 7 oz. Macerate with 4 gallons of water, press out the liquor, and compound with a solution of 2 pounds of pure saltpeter and 3¼ pounds of white sugar in 1½ gallons of water. This mixture is calculated sufficient for treating 100 pounds of leaf tobacco.

(8) N. M. B. writes: In the shop where I work, the main shaft pulleys and belts are greatly charged with electricity. Can you tell me the cause of it, and what effect it has on speed of shaft? Does it retard it? If so, is there any remedy for it? A. The electricity generated in belts is presumably due to the bending of the belt and its slight friction on the pulleys. It indicates dry air and a dry belt, and does not noticeably affect the running of the machinery. Moistening the air is the remedy if any is really needed, or a metallic comb with ground connection might be fixed with its teeth close to and pointing toward the belt. The charge can be taken from the shaft and pulley by attaching a wire to the shaft and thence to the water pipe.

(9) G. B. W. asks how to produce hydrogen and oxygen cheaply to use for welding purposes. A. You can produce hydrogen by passing steam over ignited iron scrap contained in a "through" retort or one with connections at both ends. By using coal instead of iron you will get a mixture of hydrogen and carbon monoxide that is just as good for your purpose. A very high heat is required. Oxygen can be made by heating chlorate of potash mixed with a quarter its weight of binoxide of manganese to a low red heat, or by heating binoxide of manganese alone to a very high heat. Oxygen has to be used with great care in welding, as it is liable to burn the iron. Superheated air would probably be better and cheaper.

(10) G. A. C.—See Lowe Gas Process, in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 98, 114, 53, and on Water Gas consult SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 60, 303, 398, 311. Use one square foot heating surface in boiler to 8 square feet of radiating surface for ordinary rooms, and one square foot of radiating surface to 100 cubic feet of air in exposed rooms or 120 cubic feet of air in ordinary rooms. The square root of the square root of the heating surface, in feet, in the boiler will give a fair average diameter of the main steam pipe in inches. Proportion the distribution to the radiation according to intervening pipe sizes. No radiator should have steam inlet less than ¾ inch for low steam. Medium and large radiators should have 1 inch and 1¼ inch inlets, one less size outlets; 1 inch pipe is the most suitable for radiators. There is no perceptible difference in the one and two pipe system of radiators.

(11) B. S. M. Co. asks (1) what receipt there is for staining wire, or iron or steel, blue. A. The processes are similar for obtaining colors by a stain. Bluing is generally done by heating to obtain the color desired. 2. And brown. A. For browning, wet a piece of rag with antimony chloride, dip it into olive oil, and rub the iron over. In 48 hours it will be covered with a fine coat of rust. Remove this with a scratch brush, and apply oil.

(12) J. H.—Gun barrels are not case-hardened. They are blued by heating and mottled by acids. This is a very difficult work, requiring experience and a suitable muffle oven. The browning of gun barrels is a chemical process alone. See answer to preceding query.

(13) W. G. K. asks: How can I color cop er medals so as to give them the appearance of old bronze? A. Dissolve 30 parts of carbonate or hydrochlorate of ammonium and ten parts each of common salt, cream of tartar, and acetate of copper in 100 parts of acetic acid of moderate concentration or in 200 parts of strong vinegar, and add a little water. When an intimate mixture has been obtained, smear the copper object with it, and let it dry at the ordinary temperature for 24 or 48 hours. At the end of that time the object will be found to be entirely covered with verdigris presenting various tints. Then brush the whole, and especially the reliefs, with a waxed brush, and if necessary set the high reliefs with hematite or chrome yellow or other suitable colors. Light touches with ammonia give a blue color to the green portions, and carbonate of ammonium deepens the color of the parts on which it is laid.

(14) G. C. F.—The North American magnetic pole is in about 73½° north latitude and 96° west longitude, moving west. Its greatest elongation is supposed to be about 33°. As only about ¼ of a revolution of the magnetic pole has been noticed, it is yet uncertain whether it completes a revolution or is only vibratory. It is supposed to occupy the point of most intense cold. What connection the two phenomena have is not yet known. The variation of the needle for New York for 1887 is $8\frac{175}{1000}$° and increasing at the rate of 3 minutes per annum. The Coast Survey have this work in hand, and publish reports of investigations on the subject.

(15) J. H. V. asks the greatest number of tons it would be safe to pull up an incline of four inches to the foot with a seven-eighth inch diameter or No. 9 steel wire cable. A. 15 tons.

(16) G. B. asks a varnish for protecting fence wire. A. Use well boiled linseed oil, properly laid on; if necessary, color with umber. The iron should be first well cleaned and freed from all dust and dirt; the oil should be of the best quality and well boiled, without litharge or any drier being added. Asphalt varnish or coal tar may be used instead of the above.

(17) L. F. M.—If an attempt were made to use the House telephone to talk, the Bell Company would treat it as an infringement of their patent. It will talk if constructed in accordance with the patent. If a microphone transmitter was u ed with it, the claim of infringement by the Bell Company would be by so much the more ratified.

(18) J. L. P.—The vacuum system of propulsion described by you does not take into account the theory of equality of action and reaction. The vessel would, as far as the vacuum is concerned, be pushed as hard backward as forward.

(19) J. S.—In answer to your question, how many feet of heating surface is calculated per horse power on a boiler at 60 pounds pressure, the types made us say 150 instead of 15 square feet. The latter figure is large, but is not out of the way in a small plant with such engines as are most frequently used, although with better efficiency the heating surface may be reduced to as low as 6 to 12 square feet per horse power.

(20) N. S. B. asks: How can I quickly and inexpensively freeze water in a bottle, what freezing mixture to use, and what sort of an apparatus to employ? A. Nitrate of ammonia and water is one of the best of the simple mixtures. Surround your bottle with the coldest water you can get, held in a non-conducting vessel of wood if possible. Add an equal weight of nitrate of ammonia. Stir well. A second treatment of the chilled bottle may be necessary; or what is better, if you can cool enough water to use as the solvent for the second portion of nitrate of soda, the work will be better done. Probably chopped ice with one-half its weight of salt would be cheaper and better, and two successive applications should effect the result. A mixture of 5 parts nitrate of ammonia, 6 parts sulphate of soda, and 4 parts dilute nitric acid is exceedingly powerful. Use wood as far as possible for the outer vessel, and metal for the inner. Glass will probably break.

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