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 This is for our information, and not for publication.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) D. R. P. writes: I have a valuable rifle and revolver which I desire to keep in good order. What oils shall I use? A. Sperm oil that has been exposed to the sun for a week, in a bottle, with lead shavings, makes a very fine oil, much used for sewing machines, clocks, and watches.

(2) C. P. C. desires a receipt of wine color lacquer, such as is used upon tinware, etc. A. Put 3 ounces of seed lac and 2 drachms aniline, color of shade to suit, into a pint of well rectified spirits. Let the whole remain for 14 days, but during that time agitate the bottle once a day at least. When properly combined, strain the liquid through muslin.

(3) L. B. asks the latest processes on mixing and preparing the material with which to manufacture paper buckets. A. Ordinary wood pulp is used mixed with glue or size, pressed into moulds and varnished.

(4) J. G. writes: 1. The English unit of heat being the quantity required to raise one pound of water one degree Fah., what is the measure of a unit of heat as applied in measuring change of temperature of air? A. The amount of heat which would raise one pound of water any given number of degrees would raise about one-quarter of a pound (more accurately 0·2374 pound) of air the same number. A cubic foot of air weighs 536·96 grains. A given weight of ice in melting would absorb enough heat to lower the temperature of an equal weight of water 142° Fah., or 79° C. On these factors ordinary calculations as to refrigerators can be based. Thus a pound of ice in melting would have capacity to lower the temperature of a pound of air (volume 13 cubic feet) 624° Fah. $\left(\frac{142°}{0·2374}\right)$ or to lower the temperature of 624×13 cubic feet 1° Fah. Taking 94° as the temperature of the air, the melting of a pound of ice would absorb enough heat to lower 130 cubic feet to 32° Fah. This does not take into account the additional heat absorbed in the melting of the ice nor the inevitable waste in its application. If the refrigerator is ventilated, this feature would also involve a loss in economy. 2. What chemical effect has aqua ammonia on the materials used in clothing, especially underclothing? A. If not too strong, it has a cleansing action without injuriously affecting the material. 3. What effect has aqua ammonia if taken into the human stomach? A. It acts as a strongly corrosive and fatal poison if concentrated. If very dilute, it counteracts acidity, is a stimulant, and is a good cure for sick headaches. 4. What will take out the "fire" (so called) of aqua ammonia, so that in its use for cleansing it will not make the hands feel rough? A. Mix oleic acid with it. 5. What produces the cloudy appearance of some of the ammonia compounds sold by grocers for washing fluid, etc.? A. The different washing ammonias vary in composition. Oleic acid is contained in one prominent brand, and accounts for the milky appearance. 6. What is the best combination with aqua ammonia for general family use in washing and general cleaning purposes? A. Oleic acid is very good. Such a combination is patented. 7. Can you give a formula for family washing compound and state effects on underclothing and hands resulting from frequent use and give the cause of the effects? A. Dissolve 1 pound hard soap in 6 gallons of water, then add ¼ ounce spirits of turpentine and ½ ounce spirits of ammonia. Such soaps are stronger than the ordinary varieties, and contain a large amount of alkali, which tends to rot the clothes. See a book on soap making, etc., by Watts, which we mail for $3.

(5) S. U. P. asks if the burning of bones renders them less valuable as a fertilizer. A. It does impair their value. 2. How to make silhouettes, with the aid of a good magic lantern. A. Locate the lantern three feet from a hard wall, seat the subject in a chair one foot from the wall; place a sheet of white paper against the wall, securing the four corners with flour paste, then with a pencil trace out the outline of the figure as projected by the lantern. If the paper is cut out on the lines sketched, a silhouette will be made. Black paper may be pasted on to the white sheet before cutting, if it is desired to produce a black silhouette.

(6) M. L. S. asks: 1. How great is the distance at which the telephone in its present state of perfection can be worked with good results? A. There is so much difficulty in working long lines that no general answer can be made. Although Chicago has been in telephonic communication with New York, and Boston intermittently, and Philadelphia with rather more success, we think the telegraph is more used for distances exceeding twenty-five miles. 2. To what is this limitation of distance due? Is it owing to the current being enfeebled by induction, or does the simple fact of the distance enfeeble it? A. It is owing to electrostatic capacity of the line. 3. When an iron is white hot and is then allowed to cool, does it pass through all the colors of the solar spectrum? If not, what colors and in what order does it pass through? Can the same thing be produced by chemical heat? A. Iron or steel cooling from a white heat has its surface oxidized, and only shows the gradations of temperature ranging through the yellow and red series to the black, and does not represent the prismatic spectrum. Its light is incandescent. In heating a piece of polished iron or steel, the order is reversed below 700°, and commences with the pale straw, deepening into orange and reddish brown to violet and blue, ending in black, when, if the heat continues to rise, it runs back through the red and yellow series to white. The lower heat series of colors is due to the reflection of light from the surface altered by oxidation. The oxidized surface color is permanent if properly preserved. There are chemical means of producing colors on the surface of steel, iron, and other metals by their proper degree of oxidation or the deposit of other oxides or metals.

(7) G. B. asks (1) whether common salt (NaCl) dissolved in water, and decomposed with electricity, will yield (HCl) hydrochloric acid? A. With a current of sufficient electromotive force, chlorine gas will be given off at one pole and hydrogen at the other. The electrodes must be of carbon or some material not attacked by chlorine. Otherwise only a portion or none will escape, as the electrode will be dissolved. The fluid should also be warm, as chlorine dissolves in cold water. 2. How could Cl be extracted from NaCl? A. By warming with sulphuric acid and manganese dioxide.

(8) H. S. asks: 1. Which of three midship sections of equal depth and beam will have the greatest initial stability—one with the extreme beam on the rail, on the deck, or on the water line? A. On the water line. 2. What, if any, is the advantage of building yachts with the falling-in top sides of a man of war? A. Because this form gives better lines when sailing on their beam.

(9) J. T. D. asks the best soldering solution for soldering copper wires to German silver springs, so that, after being soldered a few weeks, the springs will not be covered with verdigris. A. Use silver solder with borax flux.

(10) Machinist.—You should put nothing on leather belts to prevent their slipping. Cover the pulleys with leather.

(11) M. A. M. asks (1) the composition of perspiration. A. In 1,000 parts perspiration there are of:

Water	995·50 parts.
Sodium chloride	2·23 "
Potassium chloride	0·24 "
Sodium and potassium sulphate	0 01 "
Sodium and potassium united to organic acids	2·02 "
	1,000 "

2. If used in quantity sufficient for the exciting fluid of a common battery cell where zinc and copper are used, what parts of the fluid would have an affinity for the metals, and what changes would take place in the fluid or its parts? A. The water would suffer decomposition.

(12) G. F. R., Hawaii, asks (1) whether the use of crude petroleum as fuel for boilers is injurious to boilers, either directly or indirectly. If so, in what way? I have been using it with bagasse in the furnaces of a sugar factory. A. The use of petroleum in boiler furnaces is gradually increasing in the United States, it being principally used in connection with a steam jet. The manner of its use you will find in SCIENTIFIC AMERICAN SUPPLEMENT, No. 8, also in a book, "Petroleum Fuel," by Ross, which we can furnish for $1.50. Petroleum as fuel is not injurious to iron or the boilers. 2. Whether Stockholm tar possesses any acid or other properties in its component parts which may be injurious to iron, if used on bearings in proportion of one part to three with coal tar? A. "Stockholm tar," as also other wood tars, contains a very small percentage of pyroligneous acid and creosote. But the tar would not be injurious to iron in the manner of your use mixed with coal tar for heavy bearings.

(13) W. O. C. says: Will you please tell me how many pounds of water a cubic foot of dry granite will absorb? A. A correspondent, to whom we submitted the above inquiry, made a practical experiment, concerning which he writes as follows: We inserted a cubic foot of granite into a barrel of water, placing same on four small blocks, so that the six sides of the cube would be exposed to the water. And after the granite was in the water thirty-six hours, it was again weighed, and we find only about 1 ounce difference in the weight, and as the granite was weighed while it was wet, we calculate it was the water on outer surface that made this 1 ounce difference.

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June 14, 1887,

AND EACH BEARING THAT DATE.

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