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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 This is for our information and not for publication.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.

(5231) A. J. D. says: I have a lot of small steel and iron strips which I wish to plate with tin by dipping in the molten metal. I use the following process, but am only partially successful: Allow the strips to remain in a strong solution of sulphuric acid for a few minutes, to remove grease, scale, etc., then rinse in clear water, and dip in a solution of muriate of ammonia, for a flux. The tin adheres very well, but remains lumpy and uneven. Will you please inform me wherein the trouble lies and how I can remedy it? A. We advise a partial polishing of the articles after the scale has been removed. Then dip in hot strong caustic soda water to clean. Wash in hot water, and dip in muriate of zinc and ammonia.

(5232) F. O. J. says: There is a bad echo in the Baptist church here. The audience room is 38×50 feet inside, with a ceiling 21 feet from the floor. About 4 feet of the sides and 6 feet of the ceiling is taken up by a rounding corner, so that the ceiling proper is only 26×38. The pulpit is at one end of the room and slightly raised. Can this echo be destroyed by stringing wires near the ceiling? If so, kindly indicate the manner. Can wire fine enough to be practically invisible be used? A. The hanging of wires and wire netting closely to ceilings and walls is said to entirely prevent echo. Such arrangement cannot be made invisible, but may be so arranged with fine wire netting put up in panels with rosettes or moulding stripe as to be ornamental.

(5233) J. R. M. says: Please inform me through your column of Notes and Queries if there is any use for hardened copper or brass in the arts or sciences. Enough call that is to make it worth one's while to work for it? A. There is an increasing demand for hard copper and brass. The Eureka Tempered Copper Co., Northeast, Pa., are now making hardened copper. There is plenty of room for new efforts in the production of hard copper and brass for frictional purposes.

(5234) T. C. B. asks: What amount of power can be gained from 1 inch of water running from a reservoir or barrel of 50 gallons capacity with a pressure of 6 feet? And what wheel is the best and most powerful, in this case? A. If a miner's inch is the measure, you will have $\frac{12}{1000}$ of a horse power under 6 feet head and the 50 gallons would last about 4½ minutes. A small impact wheel of the Pelton type would give the best economy.

(5235) G. B. says: I have a friend that has a small shop thoroughly equipped for manufacturing small machinery. He has hard struggling to get enough to do, yet is a good workman. I thought if you could tell me how I could make small cheap fans that could be regulated in speed and operated by a battery, that could be easily attached to the head of a bedstead or any part of a room, and the battery and fan could be made and sold for about $1 or $1.50, I think he could obtain sufficient orders to help him out. Or is there anything you would be willing to suggest? A. Fans such as you describe are made by electrical goods manufacturers and largely in use. Doubtful if your friend can make them for twice the figure you name. He might buy one and make a trial. We cannot suggest what would be best to manufacture. Knowledge of what is on the market and prices is necessary as a preliminary to selection.

(5236) E. L. asks: What percentage of nourishment or nutriment is there in rice of the best quality? A. The analysis of rice is given as follows:

Nitrogenous matter	6·94
Fat	0·51
Starch	77·61
Woody fiber	0·09
Ash	0·45
Water	14·41
Total nutriment	85·06

(5237) G. P. asks: Will you please inform me of a good preparation to put on knives, guns, etc., to prevent them from rusting? I have several fine instruments that I find are hard to keep from rusting. I have given several preparations a trial, but find them ineffective. Please inform me of a good preparation. A. We find nothing better than wiping the instruments often with a cloth and vaseline.

(5238) D. S. P. asks: What is the usual pressure per square inch in the boilers of the three following engines: The decapod on the U. P. R.R., the ordinary eight-wheeled American passenger engine, and the engine on the New York Elevated Railroad. A. The engines drawing the high speed trains on our principle railways are now carrying from 150 to 175 pounds pressure per square inch. The elevated road engines run with varying pressure from 100 to 125 pounds.

(5239) R. I. W. asks: Would it not do to wind both the armature and field magnets of motor described in "Experimental Science," pages 497 to 509, with No. 18 silk-covered copper wire? A. Yes.

(5240) E. H. J., Mich., says: A few years ago, large flights of wild pigeons were to be seen, in the spring and autumn, in almost all of the Northern States. For nearly fifteen years, few flocks of these birds have been seen in the central or southern part of Michigan, and I have been informed that few are now seen anywhere in their old places of resort. Will some of your readers tell us what has become of these birds, which once far excelled in number every other species in America? A. The advance in population, the destruction of our forests and the indiscriminate slaughter of the pigeons during their roosting season is no doubt the cause of their scarcity at the present time.

(5241) O. C. W. asks: Can you suggest a way of painting or otherwise making opaque one-half of a lantern globe so that that part of the globe will act as a reflector? A. A reflector can be made on the outside surface of one-half of the lantern globe by depositing a coating of silver from its solution, as is largely used in silvering looking glasses. The process is a rather delicate one and described at length on pages 502 and 503, in the "Scientific American Cyclopedia of Receipts," $5, mailed.

(5242) R. R. Snowden says: I inclose an insect which is remarkable as being the first of the kind I have ever seen, though I have closely observed insect life in North and South Carolina and Florida since the late war. It seems that insects new to this part of the country are occasionally making their appearance. For instance, the electric bug was never seen here before the introduction of the electric light. So also the orange tree has several new enemies. Please give some light on the specimen sent. A. Reply by Professor C. V. Riley.—The specimen sent by Mr. Snowden is an interesting although not uncommon species known as the glassy-winged sharpshooter (*Homalodisca coagulata*). It is found all through the Southern States and is responsible for a rather common injury to young cotton bolls in portions of Louisiana and Mississippi. This damage is particularly noticeable where the cotton fields are bordered by streams edged with young growth of cottonwood. The first generation of the sharpshooters lives upon the cottonwood and the second migrates to the cotton plants. They puncture the young bolls, making a fine hole like a bullet hole, from which in part comes the popular name of sharpshooter. They have been found also in Georgia upon the LeConte pear, in Texas upon the mulberry, in South Carolina upon asparagus, and in Florida upon oranges, but they do no marked damage to any of these crops. The nearly full grown and adult insects have a curious habit, in common with their near allies, of ejecting from the anus a considerable quantity of very clear liquid honey dew. The drops are thrown out with considerable force and to quite a distance, and when the insects are abundant they produce the phenomenon known as "weeping trees." A full account of this species, with illustrations, will be found in *Insect Life*, vol. v., pp. 150-154.

(5243) J. T. S.—Reply by Professor C. V. Riley.—This large click beetle or snapping beetle is known in the books as *Alaus oculatus*, and is the largest of the click beetles found in North America. The large eye-like spots on the thorax are not the true eyes, which will be found on either side of the head and which are in reality small compared with the spots. When placed upon its back it will spring to a height of 2 or 3 inches in its efforts to resume its proper position. The larva of this beetle is a hard, yellowish brown, elongate worm, with dark brown spines at the anal end. It is found in burrows in various trees, especially those which are dead and decayed, and is supposed to feed on the dead wood. There is good reason for believing, however, that it is also predaceous and feeds on other wood-boring larvæ.

(5244) S. H. B. says: 1. An outdoor bell circuit contains about 800 feet of wire and an electric bell, and is supplied with 6 cells of carbon battery (sal ammoniac solution). The bell, in short circuit with two cells of battery, rings satisfactorily, but the six cells will hardly cause a tremor in the hammer of the bell, when working over the whole line. The line being O. K., would the addition of two (say) cells of battery cause the bell to ring properly, or would it be necessary to double or triple the number of cells at present used, to cause the bell to work two or three times as strongly? A. The failure of your bell is due to the lack of E.M.F. The resistance of the wire leading to the bell is so great as to use up a large proportion of the energy of the current. If you do not care to put up a line of less resistance, the only remedy is an increase in the number of cells. Without knowing the resistance of the bell and of the line, we cannot say how many cells will be required. 2. What is the probable voltage of an ordinary plain carbon battery (microphone, Samson, Ideal, etc., as named by makers)? A. About 1½ volts per cell. 3. Will you kindly tell me of a book which will be of assistance in such matters? My books are purely theoretical and behind the times. A. For general information we would recommend "Experimental Science;" for specific information on bell hanging we refer you to "The Construction of Electric Bells," by F. C. Alsop, price $1.25; "Electric Bells and All About Them," by S. R. Bottone, price 50 cents; "Bell Hangers' Hand Book," by F. D. Badt, price $1.

(5245) K. A. F.—Reply by Professor C. V. Riley.—The insect sent by Mr. Fichthorn is the common apple plant louse (*Aphis mali*). It is usually abundant and injurious in the early part of the summer and may be destroyed by spraying with a dilute kerosene soap emulsion prepared in the following manner: Take two parts kerosene oil and one part strong soapsuds and agitate violently by churning or by passing the liquid back and forth through a force pump into a bucket until a thick, butterlike emulsion is formed. Dilute one part of this emulsion with fifteen parts of water and spray. The life history of this, as of so many other species of aphis, is extremely interesting, and unrecorded observations would indicate that after a series of parthenogenetic generations are produced upon the apple in the early part of the season, the insects migrate in the winged female form and propagate on the roots of certain grasses during the heat of the season. In the autumn the return migrant revisits the apple, and in due time the sexes are produced and the perfect female fastens her eggs, sometimes in very great numbers, upon the terminal twigs and buds. These, at first greenish, become glossy black and carry the species over the winter. The eggs are not easily killed and the best season to spray is soon after hatching in spring.

(5246) W. S. P. asks (1) how to clean brass and German silver after hard soldering. A. Boil the soldered articles in a weak acid solution, 1 part sulphuric acid, 5 parts water. 2. Is there any toxic substance that will kill willow, maple, or fruit trees by making a small hole in the trunk and putting the substance into it? A. An injection of creosote will kill trees. 3. Is there a solder that will fuse at about 700° or 800° Fah., that will solder brass, German silver, etc.? A. Zinc or tin alloyed with a small portion of copper will make a solder for varying temperatures from 500° to 1,000° Fah. Try an alloy of 5 to 10 per cent of copper in the total quantity. The zinc and copper solder will be somewhat brittle. The tin and copper will be tough.

(5247) J. H. N. says: In the SCIENTIFIC AMERICAN about a year ago attention was called to the need of a safety petroleum lamp, as a suggestion to inventors. Could you give the necessary qualifications to be filled in a safety lamp and state if there is a premium offered for it? A. The most essential feature needed is to so construct a lamp in which there can be no admixture of air with the vapor of the oil within the lamp to cause explosion or to so close the communication between the flame and the air space in the lamp that the air saturated vapor cannot reach the flame, nor by overheat to allow an undue capillarity in the wick, which sometimes overflows and takes fire below the top of the wick tubes. There is no premium offered for a safety lamp.

(5248) T. D. B., Jr., asks: What diameter, pitch, and speed screw should I use on an 18 foot St. Lawrence skiff to consume one-fourth horse power? What speed should the boat make? A. The screw should be 12 inches diameter, 24 inch pitch and make 200 revolutions per minute for a speed of 3 or possibly 4 miles per hour.

TO INVENTORS.

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