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Notes & Queries

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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 This is for our information and not for publication.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.

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Minerals sent for examination should be distinctly marked or labeled.

(7926) W. S asks: 1. Why is it that the image on the ground glass of a camera appears upside down? A. Because the rays of light cross as they pass through the opening of the lens. Take the lens off from the camera, put in its place a piece of card through which a small hole has been made and you will see the picture inverted in the same way. The rays from the top of an object pass in a straight line through the hole and must go to the bottom of the ground glass. So too rays from the bottom of an object go to the upper part of the ground glass. The picture is inverted up and down and right and left. 2. Are there any cameras on the market, that have devices so that the image appears right side up? A. No. A right angled prism could be attached to the lens so as to erect the picture, but it is not worth while. 3. What solution combined with a solution of ferric chloride will make a green solution? A. Ferric chloride in solution will become green by combining it with any solution of a sulphate which by metathesis will produce ferric sulphate. 4. Is there any book on navel orange growing? A. The SCIENTIFIC AMERICAN, vol. 82, No. 21 contains an article on the navel orange. We can send it to you for ten cents.

(7927) C. D. R. asks: Can you give me a receipt for transparent etching ground, for retouching? Silicate of soda is transparent, but leaves a ragged edge in the lines. Is there anything I could add to it for the purpose that would not destroy its transparency? A. Retouching varnish, Sandarc 1 oz., Castor oil 80 grains, Alcohol 6 oz.

(7928) F. C. asks: How can I cover a pulley with paper or leather? Pulley is of cast iron 9 inches by 8 inches with an extra smooth face. A. Scratch the face of the pulley with a rough file thoroughly, so that there are no bright or smooth places. Then swab the surface with a solution of nitric acid, 1 part; water, 4 parts; for 15 minutes; then wash with boiling hot water. Having prepared a pot of the best tough glue that you can get, stir into the glue a half ounce of a strong solution of tannic acid, oak bark or gall nuts, as convenient to obtain, to a quart of thick glue; stir quickly while hot and apply to the paper or pulley as convenient, and draw the paper as tightly as possible to the pulley, overlapping as many folds as may be required. By a little management and moistening of the paper, it will bind very hard on pulley when dry, and will not come off or get loose until it is worn out. Use strong hardware wrapping paper.

(7829) DeF. H. asks: 1. How many volts and amperes does the simple plunge battery described in " Experimental Science " give? A. Each cell gives an average of 1·8 volts, so that in series you would have 1·8×8 or about 14 volts. In parallel it will give 1·8 volts. The amperes depend upon the external resistance principally, since the internal resistance is very small. You can safely take 4 amperes. 2. How long can this battery be used without decreasing in strength? A. Any battery begins to be exhausted as soon as it begins to do work, of course. You will obtain about 60 ampere hours from the battery, before renewing the solution. The zincs will last a long time, the carbons indefinitely. 3. What would the materials for this battery cost (approximately)? A. If you can make the case, windlass, etc., the cost is much reduced. The jars, plates, and other materials, will cost about $15. 4. Directions for making a small and inexpensive Ruhmkorff induction coil giving a 1 inch spark, for use with the two chromic acid cells? A. You will find the directions, full instructions with drawings, in Bonney's " Induction Coils." Price by mail, $1. The coil described in " Experimental Science " is a good one, and gives a longer spark. It will cost but a little more than one giving an inch spark.

(7930) L. E. T. writes: Steel being a conductor of electricity, why is it that the steel balls used in the coherer of a wireless telegraph system, being in contact with one another as they are, do not make a continuous circuit in the receiving apparatus. A. Steel balls in the ordinary sense of the word have not been used in the coherer of the wireless telegraph so far as we are informed. The coherer contains a powder, composed of metal filings. Various metals have been employed simple or mixed. Any powder, even of a conductor, is a very poor conductor. The principal reason is that the particles are *not* in close contact with one another. When an electric wave strikes this powder, its electrical resistance is very greatly reduced, as if the particles had cohered. This state continues till a jar is given to the powder, when the high resistance is restored. See Fahie's " History of Wireless Telegraphy." Price $2 by mail.

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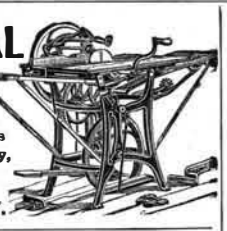

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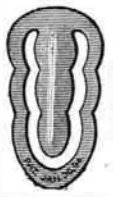

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