

(58) J. B. C. writes: Can you tell me through the SCIENTIFIC AMERICAN: 1. I wish to use a liquid electrical conductor that shall be better than acidulated water and not as good as mercury. A. We know of no solution that will meet your wants. 2. Also a solid conductor that shall have much more resistance than carbon. A. Try charcoal or a mixture of charcoal and clay. 3. How can gold be given different colors, as in the letters of a monogram? A. This is done on cheap jewelry by means of thin lacquers colored with the anilines. The finer grades of work are made from pieces of gold of different colors soldered together. 4. How is silver oxidized, as in jewelry? A. Silver may be oxidized by dipping it in a solution of sulphate of potash.

(59) A. H. writes: If a train of cars traveling east at the velocity of a cannon ball should have on board a loaded cannon the mouth of which is pointed west, about how far would the ball in the cannon travel west if the cannon be discharged? A. The ball would fall to the ground at the point of firing under the conditions you mention.

(60) D. F. D. asks: 1. What kind of cement or preparation will cause lead to firmly adhere to a smooth iron surface? A. For joining metallic surfaces where soldering is inconvenient, recourse may be had to a composition formed in the following way: Pure and finely divided copper, such as that obtained by the reduction of copper sulphate with zinc clippings, 30 to 36 parts, according to the degree of hardness desired in the cement, dissolved in a sufficient quantity of sulphuric acid to make a thick paste; with this is incorporated, by trituration in a mortar, mercury, 70 parts. The mass is soft, but hardens at the end of some hours. For use it is heated to 100° C. and powdered in an iron mortar to 150° C. It adheres strongly on drying, and is harder in proportion as it contains more copper. 2. In what way can a cement be prepared, say, thirty minutes, sufficiently hard to be used as a mould for metal. A. A cement which may be used to unite all metals consists simply of a mixture of commercial glycerine and finely powdered litharge. By mixing glycerine and litharge a paste is obtained which will harden in from ten to thirty minutes, according to the amount of litharge used. We would recommend you to try the last receipt for forming moulds, described in second question.

(61) W. H. L.—The size for preparing wood work for gilding is as follows: To half a pound parchment shavings or cuttings of white leather, add 3 quarts water; boil it in a proper vessel till reduced to nearly half the quantity; then take it off the fire and strain it through a sieve. Be careful in the boiling to keep it well stirred, and do not let it burn.

(62) M. M. B. asks how to redye sealskins. A. All of these sealskins sold in this market are prepared and cured in London, where the process is kept very secret, and no knowledge can be obtained on the subject. Some information is given on page 5510 of SCIENTIFIC AMERICAN SUPPLEMENT, No. 345, under head of "How Seal Skins are Dyed."

(63) J. A. C. asks: Which would be the best way to raise water from a drain mouth where a common outlet is not to be had? Would an Archimedean screw have any special advantage over a pump in a lift of 4 or 5 feet? Would a centrifugal pump be better than a common lift pump? Power to be a windmill. A. The best is the most simple and common lift pump (attached to wind mill). You can make one of wood or obtain one through the hardware trade from Chicago.

(64) A. N. Works asks how they can galvanize small castings without much cost. A. First dip your castings in a pickle of equal portions of sulphuric acid and water, and finally immerse in a bath of equal portions of tin and lead. We recommend you to read the article on "The Galvanizing Process," page 2798 of SCIENTIFIC AMERICAN SUPPLEMENT, No. 176.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

W. E. L.—Unfortunately in unpacking the specimens Nos. 1 and 2 became mixed. No. 3 is a black shale containing pyrite. No. 4 is a decomposed silicate, which is more or less weathered. None of the specimens sent, in our opinion, are of any value as far as their metallic constituents are concerned.—D. A. O.—The specimen is undoubtedly a fire clay, but its value can only be determined by chemical analysis. This would give the percentage of the worthless constituents. The expense would be \$25.00.

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