hours. Of this solution, 2 ounces are added to every 20 gallons of ordinary solution in the plating vats, and the whole stirred. 2. To 1 quart ordinary plating solution, containing 2 lb. cyanide per gallon, add 4 oz. liquid ammonia, 4 of bisulphide of carbon, and 2 of ether; shake occasionally, and allow to stand 24 hours. Use 2 oz. for 2 gallons of silvering solution, adding it every alternate day.

(13) G. F. writes: 1. I have a photograph lens made up of two pieces glued together. Could you tell me of any solvent which will dissolve the glue, as I want to use only one piece of the lens? A. Opticians separate lenses by boiling them in water. The temperature must be very gradually raised, as there is danger of cracking the glass. 2. How could I prepare a piece of steel for magnetizing? I have bent it into the shape required, and I would like to know how to temper it, so that it could be magnetized. A. Harden the steel and draw the temper just below a straw color.

(14) O. G. asks: 1. If a plank 12 ft. long and weighing 24 pounds is supported by two props, one 3 ft. from one end and the other 1 ft. from the other end, what is the pressure on each prop and how do you find it? A. The center of gravity of the plank is at its center. Each prop supports a weight inversely proportional to its distance therefrom. The prop 3 ft. from the end is 3 ft. from the center of gravity. The other prop is 5 ft. from the same. The first, therefore, carries 5/8 of the weight and the other 3/8, or 15 and 9 lb. respectively. 2. How many candle power can I get with a dynamo of suitable size for a two-horse engine? How many candle power are the incandescent lights equal to, such as are used in private houses? A. About 400 candle power. An ordinary incandescent lamp gives from 12 to 16 candle power. 3. How large a cell could I store in one hour with a dynamo suitable for a two-horse engine? A. You could charge 30 to 40 cells in seven hours. You should not press the charging. 4. Can you give me a receipt to apply to the skin to cure blackheads? A. For acne or blackheads see SCIENTIFIC AMERICAN SUPPLEMENT, No. 522.

(15) F. H. D. asks: I wish to know if, in the case of electric railway motors, extra weight is required for adhesion or would be required for heavy work, as for drawing heavy trains. A. Extra weight is needed if a heavy train is to be drawn, but it is the universal practice to use a large proportion of motor cars, or to place a motor in every car.

(16) F. H. B. writes: I have made an electrical machine, and fail to get a shock from it. I wound the core with No. 18 covered wire, and wound the spool, about two inches in diameter, with No. 36 silk-covered wire. I didn't have enough of silk-covered, so I wound about half of the spool with No. 32 cotton-covered. I can't get any shock from it, only just as I take hold of the handles, but when I grasp them firmly I can't feel anything. I have one bichromate battery on it. I don't think it is the core, for the vibrator works very well. A. Either your connections are wrong or your insulation is defective. It looks as if your secondary was in electric connection with your primary coil. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 160 and 569, for descriptions of induction coils.

(17) C. E. S. asks: Can you advise me of any process by which alcohol can be mixed with copal varnish on any solvent for dragon's blood that can be readily mixed with the varnish? A. Dissolve in turpentine and mix with the varnish.

(18) B. F. K. asks: What can I use to dissolve gum shellac that will be cheaper than alcohol or wood naphtha? A. Use a solution of borax in water.

(19) J. K. asks: 1. How could I melt rubber without smell, so as to produce a very thin sheet, about 4 by 8 in., or could I purchase such sheets? If so, where? A. You cannot make such a sheet by melting. It can be bought from dealers in India rubber goods. 2. Would it take more battery for a ground circuit than for a metallic circuit for a short telegraph line, having the sounder work as loud on both lines? A. The ground circuit, if it has good grounding, has the lowest resistance. Solder your wire to the gas or water pipe for ground.

(20) J. K. asks: 1. Why is the word or term engine used in speaking of lathes? Some will say, "back-geared screw-cutting lathe," and some say "back-geared screw-cutting engine lathe." A. An engine lathe is properly one provided with automatic feeding mechanism, screw-cutting gear, etc. 2. Of what is Paris green composed, and how made? A. Copper is exposed to action of diluted acetic acid and air, which produces verdigris. Copper plates are wiped over with a solution of verdigris, are dried and heated and piled up with layers of fermenting grape lees. In time the verdigris is formed, the plates swelling up and increasing in thickness. This is boiled with arsenious acid, forming Schweinfurth green. The impure Schweinfurth green is called Paris green. The latter is often adulterated with barytes. The formula is $3CuAs_2O_4+2(CuC_2H_3O_2)$ or cupric aceto-arsenite. 3. What is London purple made of? A. London purple is a waste product from aniline factories. It consists of arsenious acid colored by aniline. 4. What is the inclosed mineral? A. The mineral is iron pyrites, of no value.

(21) E. B. N. and H. A. B. write: I have my electric motor complete and now wish to make the batteries, but do not know how to make carbon plates. A. Mix ground charcoal with water and molasses to a thick paste, press it in a mould to the right shape and heat to white heat. It should be kept in the mould while being heated and should be protected from the air. The great point is to use as little liquid as possible. After one heating it may be soaked in the sirup and may again be heated. It is better to buy the carbons. Zincs can be cast in a wooden mould. Stone jars, if vitrified, will answer for the battery.

(22) C. C. B. asks (1) a varnish for paper maps. A. Use dammar varnish or Canada balsam. 2. Directions for staining sole leather some three or four different shades, varying from white to dark red. A. Sole leather is bleached with oxalic acid and whitened with French chalk, and may be darkened by dry ochers. 3. I am directed by my doctor to drink lager beer, and I find that when I bottle it myself and let it stand twenty-four hours (tightly corked in regular air tight rubber corked beer bottles), it becomes flat and a little sour and does not have the life in it or the taste that it had when corked. Is there any process by which I could keep it sweet, and like that bought ready bottled? A. Add a little baking soda, about half a salt spoonful, to each bottle after filling and cork as quickly as possible. 4. What will mend hard rubber? A. Sealing wax, or a mixture of asphalt and gutta percha melted and thoroughly incorporated with each other.

(23) F. W. M. asks if three barrels placed in a row on end are connected with one another by a pipe six inches from the bottom, and have an inlet at the top of the first and an outlet at the bottom of the third, which is kept closed, will all three barrels fill with water at the same time or in what order. A. The three barrels will first fill to the level of the top of the connecting pipes, six or seven inches. Then the first one will fill while the water in the other two, maintaining a lower level, will rise simultaneously a few inches above the connecting pipes.

(24) R. M. H. writes: 1. We have had many discussions as to how the water gets into the float which is in the water supply hogshead. The water is sometimes hot and then cold, and in less than a year the ball is so full that it sinks. They were mostly of copper, but the foreman put in a cast iron one, which he first tested and then plugged the hole tight, but it got too heavy after a while. How is this? A. The balls were not perfectly tight, and water leaked into them. The alternation of heat and cold would greatly increase the probability of their leaking. 2. What can I do to flower pots to keep the white formation off the outside and not spoil their usefulness? A. Try rubbing with glycerine and water from time to time.

(25) W. H. asks how to manufacture Worcestershire sauce. A. Mix together 1½ gallons white wine vinegar, 1 gallon walnut catsup, 1 gallon mushroom catsup, ½ gallon Madeira wine, ½ gallon Canton soy, 2½ pounds moist sugar, 19 ounces salt, 3 ounces powdered capsicum, 1½ ounces each of pimento and coriander, 1½ ounces chutney, ¾ ounce each of cloves, mace, and cinnamon, and 6½ drachms asafœtida dissolved in pint braudy 20 above proof. Boil 2 pounds hog's liver for twelve hours in 1 gallon of water, adding water as required to keep up the quantity, then mix the boiled liver thoroughly with the water, strain it through a coarse sieve. Add this to the sauce.

(26) C. H. K. asks for a recipe for making artificial honey. A. Soft water 6 pounds, pure best honey 3 pounds, white moist sugar 20 pounds, cream of tartar 80 grains, essence of roses 24 drops. Mix the above in a brass kettle, boil over a charcoal fire five minutes, take it off, add the whites of two eggs well beaten; when almost cold, add 2 pounds more honey. A decoction of slippery elm will improve the honey if it be added while cooling, but it will ferment in warm weather and rise to the surface.

(27) W. E. C. writes: I desire now to know how the chloride of silver cell or battery is made. A. Cast a cylinder of chloride of silver around a silver wire. This forms the negative element. Use a plate of zinc unamalgamated for the positive and immerse both in a solution of salammoniac. The chloride of silver and zinc should not touch each other. Instead of salammoniac, caustic potash solution, 75 potash to 100 water, may be used. The chloride of silver may be pressed into a parchment or cloth bag instead of being cast.

(28) W. C. S. asks for a formula for making an artificial stone that will percolate water. A. We give three formulas:

Mix	Parts by weight. I.	II.	III.
Clay	10	10	15
Chalk	1	1	1
Glass sand, coarse	55		
Glass sand, fine		25	65
Flint powdered		30	5

(29) C. F. M. asks for the best method of exterminating moth (tineites) from carpets without removing them from the floor. I have been told that very hot water heavily impregnated with sulphur will answer the purpose, but if this is efficacious, is it not deleterious to the fabric of the carpet? A. Soaking with naphtha is supposed to be efficacious, but is very dangerous as regards conflagration and would affect insurance. We should advise taking up the carpets and having them thoroughly beaten. Sulphur will be without any effect or will have very little.

(30) A. M. W. asks what other and cheap insulators there are besides glass, rubber, porcelain, ebonite, silk. A. Gutta percha, paraffin, petroleum, sulphur, dry wood, silica, lime, chalk and many other substances are ranked as insulators. The term is a comparative one, as they vary in the perfection with which they work.

(31) C. D. F. asks: 1. How many patents have been obtained, in this country, on car couplings? A. Up to the middle of November 1888, 4,137 patents have been granted in the United States Patent Office for car couplers. 2. Where, in the United States, is the best school for learning mechanics, theoretical and practical? A. Cornell University, Ithaca, N. Y., stands, with some other institutions, in the lead. It is impossible to award precedence to a single college.

(32) A. W. H. asks whether February, 1892, will have twenty-eight or twenty-nine days. A. It will have 29 days.

(33) B. C.—A fusible alloy kept melted will generally oxidize and gain weight. Bismuth is sold by dealers in metals and chemicals.

(34) C. C. C.—You can probably obtain a patent, and it may prove of value.

(35) S. H. T.—The substance sent is a fungus of the genus *Merulius*, probably *Merulius himantoides*. Some of these fungi are very injurious in houses and especially in greenhouses.

(36) J. G. B.—The plant is *Spiranthes cernua*, or ladies' tresses. It is an orchid.

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