monium, containing nearly double the quantity of fluorine that the neutral fluoride does. 3. I also wish to make a substance of about the consistency of ordinary paint, that, when coated over glass, will corrode or rough its surface. A. Mix "white acid" with powdered sulphate of baryta and enough water. For all operations involving the use of fluoride of ammonium or of hydrofluoric acid, you must use vessels of lead or gutta percha.

(13) W. H. M. asks: 1. Is the sun always direct south at twelve o'clock? A. No. Only on 4 days in the year. It is fast or slow, varying from 0 to 16 minutes. See your almanac. 2. Has perpetual motion been discovered yet? A. No.

(14) N. D. writes: I see by the New York *Tribune* that Congress has "refused money to sheathe with copper the bottom of the new steel vessels." How can copper be fastened to bottoms of steel or iron vessels? A. A wooden skin is bolted on over the iron or steel hull, and the copper fastened to the wood, it being necessary to completely isolate the copper from the iron, to prevent galvanic action.

(15) E. M. W. asks how to clean a violin bow that has become greasy and will not hold resin. A. Rub carefully with best yellow soap on a small piece of flannel, then wipe dry with a piece of calico or linen; in an hour afterward it will be ready for the resin; or use a solution of borax and water.

(16) A. V. C. desires formulas for embalming fluid (face tint) and chemical razor, such as are used by undertakers, the last named being a preparation for removing hair. A. The face tint consists simply of an embalming fluid, for which there are numerous receipts, one of which is to mix together 5 pounds dry sulphate of aluminum, 1 quart warm water, and 100 grains arsenious acid. See articles on embalming in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 51 and 155. The chemical razor is an ordinary depilatory, consisting of sulphide of barium or calcium.

(17) J. R. T. asks how to get a red color on yellow brass castings after they are cast, without using any acid; also a good flux for brass. A. The peculiar orange or red color is due to the quality of the metal and manipulation after pouring. Yellow brass will not produce the color to any extent. A composition of tin and copper, such as used for valve work, will come out of a brilliant color by dipping in water a few minutes after pouring. A little pulverized charcoal is all that is useful as a flux substitute in brass melting.

(18) T. E. K. asks: 1. What can be done to Russia iron when it rusts or to prevent it from rusting? A. Rub down the surface with plumbago and linseed oil. 2. How is starch made to give linen a gloss? A. See answer to query 15 in our issue of February 26.

(19) C. F. B. asks: What will remove dandruff from a person's head without injury to the skin or hair? A. Take a thimbleful of powdered refined borax, dissolved in a teacupful of water; first brush the head well, then wet a brush and apply the mixture to the head. Do this every day for a week and then at longer intervals. Thorough cleanliness and frequent, but not violent, brushing, at least every night as well as morning, will generally keep the head free from dandruff.

(20) C. S. F. asks what gumwood is good for, also if it is subject to dry rot or attack by worms? A. It may be used for water pipes, as in the salt works at Syracuse; it is also good for hatters' blocks, wheel naves, and cog wheels. The wood is close and tough and resists splitting, though it decays sooner on exposure to the weather than elm.

(21) J. H. M. asks how to mix a good bright acid dip for brass work previous to lacquering. A. Clean the articles in strong nitric acid for a few seconds, or 2 parts nitric, 1 part sulphuric, 1 part salt. Wash in hot water.

(22) J. A. W. writes: Can you recommend something, as a liquid, or in any other form, which can be rubbed on a horse to keep off horse flies? A. Procure a bunch of smartweed, and bruise it to cause the juice to exude. Rub the animal thoroughly with the bunch of bruised weed, especially on the legs, neck, and ears. This remedy is said to be good against flies or other insects for 24 hours. The process should be repeated every day.

(23) J. W. H. writes: Are intermittent springs a reality or a myth? If a reality, what is the probable cause? A. Intermittent springs are a reality, and are caused by peculiarities in the underlying rock formation, by which water accumulates in cavities with a siphon outlet, so that the cavity fills and starts the siphon, which runs until the cavity is emptied or the action broken. Other intermittent springs depend upon the rains, perhaps, falling in distant districts for their flow. Their times are not measured with regularity.

(24) R. C. P. writes: I inclose you herewith specimens of mineral for your examination, found in this town while drilling for an artesian well, at a depth of about thirty feet. A. They are pieces of the drill point which have broken off and become rounded by the attrition.

(25) J. C. asks: The magnet in the tube of ear piece to the Bell telephone appears to be wound by two or three wires twisted together and treated as one. What is reason for this, and how are ends of the wires joined if this is the case? A. The bobbins are wound with a single wire, but its end is attached to several terminal wires to guard against breakage.

(26) A. O. W. asks who the inventor of the spectroscope was. A. In 1860, Professor Robert W. Bunsen and Gustav Robert Kirchoff, both of Heidelberg University, jointly invented spectroscopicanalysis. Any prism may be termed a spectroscope, but the modern spectroscope may be assigned to 1860, and to the above as inventors.

(27) E. N. B. asks whether a wheel mounted on a shaft having suitable bearing, and placed under a magnet of sufficient power to counteract the force of gravity, and all inclosed in an air tight receiver, and a perfect vacuum formed therein, would, after being started, come to a state of rest? A. The wheel would come to rest very quickly; currents of electricity would be induced by the motion, and this would involve an expenditure of energy.

(28) J. W. V.—A current is only produced in a secondary coil when the current in the primary undergoes some alteration. If the primary current is stopped or diminished in any way, a current is induced in the secondary in the same direction. If the primary current is started or increased, the current in the secondary is in the inverse direction.

(29) D. H. asks: 1. How much power is required to work a set of telegraph instruments one hundred yards distance? A. For telegraph instruments use about four gravity cells. 2. Would a dressing of wood ashes be beneficial to onions? If so, state when, how, and the quantity required to the acre? A. Wood ashes are an excellent dressing. Use from two to five tons to the acre. 3. When stable manure cannot be had, would pea vines plowed in answer as well? A. Pea vines plowed in would be a very poor substitute for manure.

(30) Young Blacksmith.—Ordinary malleable iron castings cannot be welded. The central part is not perfected in the annealing process. Malleable iron shears and other cutlery that is steel faced are made of good iron, and thoroughly annealed, so as to be homogeneous throughout the piece. Then the welding may be done in the ordinary way, with borax flux. The welding of cast steel of high grade is rather difficult, but can be done with borax. It is better to use double shear steel, which answers well for cutting tools and may be readily welded to iron or to itself with borax flux. Clock springs are tempered by dipping in a pot of lead heated to a cherry red, then in oil to harden. Draw the temper in boiling oil. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 95, 103, 105, 397, 221, 222, on Hardening and Tempering Steel.

(31) I. A. T. asks the correct mixture for making German silver. A. For fine German silver:

49 parts	Copper.
24 "	Zinc.
24 "	Nickel.
2½ "	Aluminum.

All by weight. There are alloys of many other proportions that are recognized as standard.

(32) A. F. D. wishes to know what the pressure of water would be at the lower end of a pipe line 5½ miles long with an average grade of 150 ft. to the mile. Also if hot water from hot springs would lose any of its heat in running through the above named pipe. A. There will be 354 pounds per square inch pressure at the lower end when the water is at rest or not being drawn. If pipe is left open for free running from the full orifice of pipe, the friction of the water will largely lessen the pressure. The heat lost will depend upon the size of the pipe and velocity of the water, as well as the protection it may have from radiation.

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