

Business and Personal.

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J. N. F. can copper his iron castings by using the recipe on p. 153, vol. 26.—L. C. will find a recipe for a good cement for leather on p. 119, vol. 28.—C. M. C. can repair his rubber bladder by following the directions on p. 208, vol. 30.—S. M. B. will find the wire gages described on p. 363, vol. 28.—Y. C. R. and all other readers of this journal ought to know that there is no machine for indicating buried gold, silver, or other treasure.—P. & F. B. are informed that the issue containing the account of the henry is out of print.—L. H. I. M. does not send data enough for the solution of his equation.—A. S. will find an explanation of the revolving wheel question on p. 27, vol. 23.—J. W. S., who enquires as to lenses and telescopes, has omitted to send his full address.—S. R. H. will find descriptions of tool steel on p. 21, vol. 31.—C. B. L. will find recipes for aquarium cement on p. 274, vol. 30.—P. H. C. will find directions for moulding rubber on p. 363, vol. 30.

L. A. G. asks: Can you give me a good and cheap plan for constructing a cistern to gather soft water? I propose building one 30 feet long, and 10 feet wide and deep, lining bottom and sides with a 4 inch brick wall, laying the bricks in mortar of sand and fire clay (in equal quantities, mixed) with an arch on top, of 4 inch brick. A. A cistern built in this manner would not stand; a side wall 4 inches thick and 10 feet high, if built in a straight line, would be thrown down by the pressure of the earth on the exterior when the cistern is empty. A better way is to build it circular, say of twenty-two feet diameter, erect a brick pillar in the center of two feet diameter, and then throw the arch from the pillar to the exterior wall, extending around in a circle; in which case the span will be only ten feet, and the outside wall will resist the pressure of the earth. The crown should be some distance down from the surface of the ground, in order that the sides of the arch may be properly loaded. But even in this case it will be better to lay the bottom in two courses of brick, one on edge, and make the arch 8 inches thick.

G. C. R. asks how to remove ink stains from paper? A. Try a solution of chloride of lime in water.

W. A. D. asks: 1. Is there such a metal as Chabannean metal, an alloy invented by one M. Chabanneau, to imitate gold? A. Yes, metal so called is used in the manufacture of cheap jewelry. 2. Will it wear equally as well as gold with the same care? A. We can not say, having no positive knowledge. Probably not. 3. How can I tell pure gold from an article that is merely washed or lightly plated? A. By its specific gravity, that of gold being 19.3. The imitation will be much less. 4. What fluids used by the finemakers to make solder stick to tin? A. Hydrochloric acid saturated with zinc.

J. H. C. asks: 1. What would be the result if the star Arcturus should strike the earth? A. The earth, as an earth, would probably be destroyed. 2. Can you give me a recipe for a varnish for canvas which will not be affected by the heat of the sun, or make the canvas stiff? A. We know of no varnish that will answer your purpose.

S. C. H. says: 1. I wish to paste common tracing cloth on a paper background. What kind of paste can I use? I have tried albumen, which admits of the cloth peeling off. A. Gum tragacanth might be used. 2. I also wish to varnish the glazed surface. What kind of varnish can be used? I have tried white dammar varnish, and it does not dry. A. Mastic will probably answer your purpose.

W. S. V. says: Can you tell me what the enclosed substance is? It was found floating in the water in large quantities near Montauk, L. I., last summer. Fire and acids seem to have no particular effect on it. I tried acids, hot and cold, and left it in a coal fire under the coals for two hours, and in a wood fire about the same time, and it came out of the coal fire a little more brittle than this specimen which I send, broken from the same specimen before trying it. This specimen has not been tested. It melts before the blow-pipe with soda. A. It consists of a siliceous skeleton which loses a certain amount of organic matter on ignition. Distributed through the mass are particles of sand. It is likewise impregnated with saline matters. It appears to be the debris of marine organisms compacted together by the action of the waves.

D. O. C. asks: 1. How many ounces of blood will I gallon of rich fresh cow's milk make? A. No reliable computation has been made. 2. How can I make the common sulphur match? A. Take phosphorus 4 parts, water 10 parts, fine glue 6 parts, red ochre or lead 5 parts, small 2 parts. Mix the glue with a little water, and convert by a gentle heat into a smooth jelly; put into a slightly warm porcelain mortar to liquefy; rub the phosphorus down through this gelatin at a temperature of about 145° to 150° Fah. Add then the other or lead, and lastly the small, until the whole forms a uniform paste. The sulphur match should be dipped into the mixture in the usual way.

W. J. S. asks: 1. Which is the best way to regulate the temperature of an incubator by means of balanced valves? I have tried to work them by mercury in a bottle, and a float up the neck connecting with the valve; but the mercury does not expand enough to work it. A. Lengthen your tube of mercury and the result will probably be more satisfactory. 2. What are the shells of eggs composed of, besides lime? My hens eat their eggs as soon as laid if not watched, shells and all. I think that they do not find enough lime in their food to make shell. A. Take a quantity of bones, burn and pulverize them, and mix with the feed; this will give the requisite quantity of phosphate of lime.

B. T. G. asks: 1. Do candy manufacturers use poisonous articles in the coloring of candies? A. It has been stated on good authority that nearly half the candy manufactured contains, in the form of coloring matter and otherwise, really poisonous matter, and this is principally in what is called French confectionary. 2. Are our commercial teas (called China and Japan teas) adulterated in this country? A. Yes, but to a somewhat limited extent. 3. Is beet sugar manufactured to such an extent in the United States as to be called an article of commerce? A. The manufacture of beet sugar in this country is as yet comparatively in its infancy, but it promises much. 4. Are there any manufacturers of sirup by a chemical process, with muriatic or other acid, out of old rags, etc.? A. For many years chemists have made sugar in the laboratory in this way as a curiosity, but we know of no one who makes a business of manufacturing sirup by this method. 5. Is it probable that an expert can invariably tell (by a detection), within one cent, the commercial value of any kind and grade of tea? A. We have very little doubt but that such men can be found.

O. N. asks: Is not the grass left on lawns cut by lawnmowers injurious to the lawns? Wherever the cut grass remains, the lawn looks thin, dry, and dead. If the decaying grass destroys that on which it falls, in time it would exhaust the soil. The lawn looks much better before being cut than after. A. The change is probably due to the atmosphere of gases, heat, etc. generated by the decaying or fermenting vegetable substances, grass, etc., also to the partial absence of light.

A. asks: How can I make a cheap microscope? A. Every convex lens is in itself a microscope; the only difference between it and the larger or compound instrument is that, instead of viewing the first formed image, a second and still more powerful lens is used, which receives the image and still further magnifies it. The cost of microscopes is due to the necessary extreme perfection of the lenses used.

J. P. L. asks: How can I test a cellar for dampness? A. The easiest way for you to test for moisture in your cellar will be to provide yourself with a thermometer, a glass tumbler filled with water, and a piece of ice; then notice how low your thermometer, when placed in the tumbler, has to sink before any moisture begins to show itself on the outside of the vessel of cold water. The lower the temperature to which the thermometer has to sink before moisture is precipitated, the less there is of it in the moisture of the cellar.

M. M. asks: In refitting the bearings of an engine lathe, how can I best set the mandrel and face plate in the right position to the bedplate? The face plate is 29 inches in diameter. A. If the bearings of your lathe head are to be Babbitted, as your question indicates, set the lathe head in position by placing a parallel bar of iron between the centers of the lathe and apply a large square to the rod and the face plate of the lathe, which will denote the exact position for the lathe head. If the journals are of brass and require renewing, mark off their height (from the bed of the lathe) by a trammel made from the height of the center of the poppet spindle to the bed, and then mark them sideways by means of a square placed across the face of the bed of the lathe, placing the edge of the square exactly even to the bearing of lathe bed where the lathe head fits. Or, in the latter case, you may use the old brasses as a guide for marking the new ones, making such allowances as practice or the lathe demonstrates to be necessary.

W. S. W. asks: What is the principle of Bude lamp invented by Benjamin Thompson (Count Rumford)? A. The Bude lamp is an argand lamp, through the center of the burner of which a current of pure oxygen gas is passed, which enormously increases the brilliancy of the flame.

A. N. H. says: 1. In plating with nickel, it sometimes chips off. What is the cause and how can I remedy it? A. Extreme care should be taken to thoroughly cleanse and coat evenly with copper, by immersion in solution of blue vitriol for a short time. If properly prepared, you will probably find no further trouble. 2. How is the solution kept always neutral? A. By keeping sufficient surface of the anode exposed in the solution. 3. How is ivory dyed blue? By keeping the ivory immersed in a dilute solution of sulphate of indigo, partly saturated with potash, for some time. This will give you a fine blue.

W. B. V. says: Parties selling gasoline burners sell also a formula or recipe for preparing the gasoline, to render it safer: powdered alum, soda, salt, etc. But the seller also offers it already prepared at 40 cents per gallon. Is all at stuff necessary to render the gasoline safer or better, or is it to insure the sale of it at 40 cents? Is not pure gasoline as safe as the mixture? A. No mixtures of this character impart safety. No burning oil is safe except those of high specific gravities and boiling points.

W. F. W. asks: Will a band saw take the place of a common straight mill saw for sawing lumber from hard and soft wood? A. Band saws are used for the above purpose with much success. See illustrations of ship timber band saws in SCIENTIFIC AMERICAN, p. 175, vol. 23.

O. C. L. asks: 1. How can I make a simple self-registering anemometer? A. There are several forms of this instrument; the most usual consists of a small vane with fans, which the wind turns; the velocity is deduced from the number of turns made in a given time, which is measured by an endless screw and wheel work. 2. How can I prepare paper which will be discolored at any point by the simple passage of a moderate current of electricity through it? A. Soak the paper in a solution of iodide of potassium and starch. 3. Will you give me a recipe for making lemon sugar that will not injure the health? A. Use tartaric acid and powdered sugar in the proportion of one to four.

J. J. H. asks: Can you give me a good and cheap recipe for making laudanum? A. Take of opium (moderately fine powder, dried) 2½ troyzs., water and alcohol each, 1 pint; diluted alcohol sufficient quantity. Macerate the opium for three days with the water with frequent agitation, then add the alcohol and continue maceration for three days more. Introduce the mixture into a percolator, and when liquid has ceased to pass, pour the diluted alcohol upon it until 2 pints have been obtained.

W. W. asks: What is the length of 8 centimeters in inches? A. 3/16 + inches.

F. M. B. says: I have a self-inking job printing press; and when I undertake to print a large form (the type being evenly planed and impression screws being evenly adjusted), I get an impression on only one side of the form, and the same is true when I undertake to print a small address card. Is there a simple method by which I can ascertain if the plate is perfectly parallel with the platen? A. The fact that your form gives an impression on one side only is proof that the platen is not set parallel with the bed, and the fault can only lie in the adjustment screws of the platen. The maker of the press can undoubtedly supply you with a gage to set the platen, but proper adjustment of the platen screws will (if the faces of the bed and platen are true) set them perfectly parallel to each other and give an even impression.

T. D. asks: Is there any market for sumac in bales, unground, and is there a way to get its properties in a liquid form? A. There are many varieties of this shrub, some of which are used in tanning and dyeing, and some in medicine. It is used also instead of galls in the manufacture of ink. Rhus wine is also made from this. The market for it is very limited, and the supply exceeds the demand.

G. M. asks: Is there any such thing as a mermaid living in the sea? If so, where can it be found and to what class of fish or animals does it belong? A. Descriptions of several such monsters were anciently published, but Sir Humphrey Davy asserts that a human head, mamma, and a fish's tail are absolutely incompatible in one body.

A San Francisco gentleman says (in commenting on our reply to C. H. M., who asked: "Which is the healthiest State in the Union?") in which we said: That State in which the greatest regard is paid to religion, law, and education. In respect to physical advantages, most are in the first rank; "You bigoted savages, what has religion to do with health to a sensible man?" A. Our correspondent will peruse for his enlightenment the death rates of ministers of the Gospel, of Quakers and of communities professedly following a religious life, with those of his acquaintances among the various "hells" for which San Francisco was at one time mostly celebrated.

A. J. S. asks: Does the wind ever change directly from the east to the north, or does it always go around by south and west to the north? A. The wind may change from the east to the north, or from east to south and thus to the west. If it follows the latter course, the clearing of the weather is regarded as permanent. If it changes from east to north, the weather is regarded as uncertain.

W. H. W. asks: To what uses is verdigris applied? A. Verdigris in an impure state is much used as a green pigment. In the pure state, it is employed in medicine.

N. H. says, in reply to a correspondent who asked how to take the dirt off a machinist's hands, some time ago: I find that sawdust is good. Put on a coat of good soap, then rub it off with pine sawdust.

J. S. K. says: I cured a rusty tea kettle as follows: I got a piece of quick lime about as large as my fist and slacked it in the tea kettle that evening, filling the kettle full of water and letting it stand on the warm stove; the next morning I emptied the lime water into a bucket and rinsed the kettle, and it was used during the day as usual; at night the lime water was poured back into the kettle and warmed, and the next morning again poured out, and so repeated, the next night making three nights in all, and that tea kettle was cured! It has not shown a symptom of rust in the water since. I will state that every night the kettle is emptied and left open to dry.

C. R. says, in reply to a correspondent who asked for explanation of "Jerker" beef: The whites who settled Central and South America found beef, used by the Indians, dried in long strips, and it is so prepared by the Guachos and others to this day. The native name for it is *charqui*, and *charquibeef* in English speech very soon and easily became "jerker" beef.

P. D. R. says that the spoon and tumbler experiment can be tried with the same tumbler by first trying the tumbler with the spoon in it, and then, if the hot water does not break the glass, trying the same glass (after it has returned to its normal state) without the spoon. If it breaks then, the inference would be that the spoon saved the glass.

F. C. R. says that poke root (*phytolacca decandra*), sliced thin and laid about a house, will destroy cockroaches quicker than any other poison. It never falls.

T. D. says: Your answer to P. D. R., p. 395, last volume, about the spoon and tumbler, has placed you in a dilemma from which you might be extricated by trying first the spoon in the tumbler and then pouring in the hot water; and if the glass did not break, then try the tumbler alone. If it broke, then find out the reason why. This spoon and tumbler business is an instance of how remarkably prone men are to take up half an idea without trying to find out the principle involved. Why does hot water break a tumbler at all? Answer: Because the glass heated at one place expands too rapidly for the unheated part and breaks. But if you take a spoon, or anything else, and prevent the sudden heating of the bottom of the tumbler by gradually pouring the hot water and heating the sides as fast as the bottom, you will probably save the tumbler.

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

A. says: Enclosed is a specimen of what seems to be one rose growing out of the center of another. There is another example of the same on the same bush. This abnormal rose is not of a character sufficiently unusual to rank it among monstrosities. The second rose is upon a continuation of the stem. In some instances the second flower is found upon a shoot issuing from below the calyx. This is sometimes noticeable among rhododendrons.—F. M.—One specimen consists of delicate crystals of carbonate of copper. The other consists of a quartzose rock, stained with silicate of copper and containing a little magnetic oxide of iron.—J. H.—It is basaltic or touchstone. It is a flinty Jasper, upon account of its hardness and black color for try the purity of the precious metals. The color left on the stone after rubbing the metal across it indicates to the experienced eye the amount of alloy.—M. F.—No. 1 is specular iron ore. No. 2 is blende or sulphid of zinc in quartz.—C. H. B.—It is a variety of brown hematite, or the hydrated sesquioxide of iron.

F. K. asks: Can you give me a recipe for making good Bologna sausages?—G. W. F. asks: How are the suction bellows placed in a parlor reed organ? By what mechanism are the pedals kept in an upright position? How is the tremolo fan made, and where is it placed?—C. asks: Is there anything in the shape of green japan in use, or what is the green paint that will stand baking?—G. F. L. asks: Will some one tell me how to bud rosebushes?—A. J. asks: How many square feet of surface should a parachute have to sustain a man's weight, say 150 lbs., in the air?—W. W. asks: What is Spanish wax?—J. F. A. asks: How thick is the helmet used by divers? How is the water kept out? How is it fastened to the diver's head?

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

- On a Boiler Explosion in Michigan. By M. A. K., and by K. P. C.
- On Electricity and Magnetism. By C. E. G.
- On Solar Attraction, etc. By S. W. R.
- On an Arrow Head. By C. M. B.
- On a Lunar Atmosphere. By W. F. Q.
- On Light, considered Metaphysically. By D. H. B. Jr.
- On Early Steamboats. By D. R. P.