answered by simply saying one or the other, or by a yes or no, as is sometimes the case in a question on which a wager is pending. Such disputes usually arise from a misunderstanding, or a difference in statement of the terms, rather than in a variance of opinion as the actual question at issue. Fires are started both ways, with the ash pit door or with the furnace door open, according as the fire is laid, the attention to be given it and the time. Ordinarily a fire under a boiler should, if possible, be lighted on top of the kindling material, so that the first combustion shall be perfect to start the draught. The top door should be open that the fresh air may reach the flame and prevent dense smoke. When the kindling wood is well on fire, open the lower door a little way to clear the smoke from the ash pit and establish a draught through the grating. Then put on coal and shut the upper door, opening the lower door enough to keep the fire bright. With a little management in this way a fire may be started under a house heating boiler without filling the house with smoke. In starting a fire under the grate, with the ash pit door open, the fuel must be more carefully laid to insure a draught to start with, and the intial progress is then frequently accompanied with puffs of smoke.

(11) H. R. F. asks what chemicals, if there are any, will separate tannic acid from gelatine, also what will dissolve common tanned leather? A. It is one of the first illustrations frequently employed in the study of chemistry, that tannic acid and gelatine make a chemical, and not a mechanical, compound, and become an insoluble one. The gelatine and tannic acid cannot be recovered back from such compound; nor can tannic acid, fibrine, and gelatine, of which tanned leather is made, be ever brought back to their orignal condition after being once made into leather. There are some adherents in Germany of a theory that tanning is a mechanical and not a chemical combination, but it has never been proved. A great difficulty with the subject lies in the fact that there is much difference in the action and power of combination of the tannins obtained from different substances, for reasons which are not understood; the tannin from gambier, valonia, sumac, etc., can be washed out of a skin to a certain extent in a way which cannot be accomplished when the tanning is done with oak or hemlock bark.

(12) R. G. P. asks how many Grenet batteries it will take to run a boat 20 ft. long by 4 ft. 4 in. beam, and 21 in. deep, and how many miles an hour. A. About 3,000 ordinary sized Grenet cells would be required to develop a speed of 6 to 7 miles an hour. If you want to use batteries, you need special large sized low-resistance cells, and of these far fewer would be needed, say 350 cells.

(13) T. E. writes: We have a barge sunken; her decks are tight, but 24 feet below the surface of the river. In pumping her out, please tell me which will require least power—to pump the water above the decks, and discharge it 23 feet below the surface, or to pump it above the surface of the river? A. The same power will be required, assuming the water to be discharged exactly at the surface level in the second case supposed. If discharged above the surface, the extra height represents extra power.

(14) L. L. asks how frozen glue is made, such as is used by leather manufacturers. A. Frozen glue is what its name denotes. The glue while gelatinous is sliced, placed on nets and allowed to freeze by natural cold. Of course the process can only be conducted in cold weather. The product is porous and much more bulky than hard glue, but is a better article, as it dissolves more easily. It sells largely in New England, where it is preferred by buyers to the hard glue.

(15) J. H. P. asks: 1. The kind of iron and the mixture for making malleable iron. A. No. 5 and 6 iron mixed, or scrap and No. 6. 2. The best kind of scale to put in the annealing cans, and how long should it take to anneal a round piece, say one-half inch thick. A. Forge scales or pulverized hematite, anneal 4 to 6 days at red heat. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 399, "Malleable Iron Castings."

(16) M. E. P., Kentucky, asks: Is there any means of patching or resilvering mirrors, which I could do at home? A. Clean the bare portion of the glass by rubbing it gently with fine cotton, taking care to remove any trace of dust or grease. If this cleaning be not done very carefully, defects will appear around the place repaired. With the point of your knife cut upon the back of another looking-glass around a portion of the silvering of the required form, but a little larger. Upon it place a small drop of mercury; a drop the size of a pin's head will be sufficient for a surface equal to the size of the nail. The mercury spreads immediately, penetrates the amalgam to where it was cut off with the knife, and the required piece may now be lifted and removed to the place to be repaired. This is the most difficult part of the operation. Then press lightly the renewed portion with cotton; it hardens almost immediately, and the glass presents the same appearance as a new one.

(17) G. H. W., Waterville, Me., asks: 1. How can I remove tincture of iron stain from a cotton fabric, and indelible ink stain from linen? A. Use dilute hydrochloric acid in order to remove the iron stain, and javelle water or some of the hypochlorites for the ink stain. See "Table for Removal of Stains and Grease Spots," in SCIENTIFIC AMERICAN SUPPLEMENT, No. 158.

(18) W. G. McC., Lake Forest, Ill., asks how to make a white ink. A. For writing on black or dark paper, use the finest or lightest zinc or white lead in a weak solution of gum arabic or dextrine. For writing on blue paper, tinted with ultramarine, use a solution of oxalic acid.

(19) A. M., Lowell, Mass., wants the manner or process of curling feathers worn on ladies' bonnets. A. When the curl has come out by washing the feather or getting it damp, place a hot flat iron so that you can hold the feather just above it while curling. Take a bone or silver knife, and draw the fibers of the feather between the thumb and the dull edge of the knife, taking not more than three fibers at a time, beginning at the point of the feather and curling one-half the other way. The hot iron makes the curl more durable.

(20) A. C. M. asks: Will two cells of Grenet battery (size of zincs 2½ by 4¾ in.) have sufficient power to run a one candle power electric lamp? A. Four cells would be necessary to give satisfactory results.

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