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Notes & Queries

E. B. H. asks how to galvanize sheet iron.

E. M. D. asks how old zinc can be made pure for use in a battery.

A. F. V. wants to know the best and quickest mode of kiln drying lumber.

E. J. C. asks: What is the preparation and process of burnishing gilding on china.

D. P. asks: How can I toughen horse hair so that it will not be brittle?

G. G. F. asks how to remove slight scratches off the face of a looking glass.

T. Y. S. asks how to bleach China grass. It can be made as white as snow.

R. R. asks: At what speed should a band saw run to cut saw logs best?

S. H. H. asks how to remove the rough back off the shell of the pearl oyster.

A. S. asks if it is possible to draw wire from a gold dollar to reach the length of a mile? If not, what length can it be drawn to?

W. W. C. asks: Is there anything that will make leather stick to iron and form a water tight joint for hydraulic rams?

C. H. R. asks for a recipe for an elastic polish or varnish that will give a patent leather finish, or one that will resemble it. It should bear bending and not break.

A. F. S. asks for the precise method by which gold fish are made to spawn. "I have a pond in which I have kept the same gold fish for over three

years, and up to the present time they have not multiplied."

W. S. asks: 1. What will remove black ink from writing paper without injury? 2. What is the easiest way to make a hole in a watch spring, without taking the temper out?

J. R. C. asks: What is the best kind of material for a float for petroleum? "I want something that will float freely on the oil and that will not become affected by it."

C. M. D. asks for a rule for measuring painter's works on iron bridges; for instance, a bridge 800 feet long x 100 feet high x 20 feet wide on top. Are the sides, length, and height measured as lattice work or once through?

R. R. asks: 1. What is the best time of the year as regards health to go to the Isthmus of Panama, and what sanitary course should be pursued?

C. J. F. says: I have a flat roof covered ten years ago with pitch and gravel. It now begins to leak a little. I have been thinking of scraping off the loose gravel and then applying a coat of Rosendale cement, say half cement and half sand. What do you think of it? Will it crack?

R. R. asks: If somebody buys a tract of land with a watercourse through it, and pays tax on the whole tract, water and all, has he a right to close up the creek with a dam, or must he let other people from below float their saw logs through his land? The logs could not float if the man had not dammed the creek some.

A. F. O. asks: What is bichromatized gelatin? How is it prepared, and what are its properties and uses? 2. How can I make a quickly drying cement that will resist the action of boiling alcohol, or with what varnish can I cover ordinary cements to accomplish the same object? 3. Is there any work in which are minutely described the manipulations of thermometer making, especially blowing the tubes and graduating the scales?

G. H. H. asks: Why is it that, in putting the finger on either the in or outside of the closed eye, a dark spot will appear on the opposite side of the ball in daylight, and a bright, luminous spot about the size of a gold dollar in the dark? It is an experiment which all can try; perhaps thousands have noticed it before; but what is it that appears so bright where all else is dark, because of a little manipulation of the closed eye and lid by the finger?

D. S. says: On page 52 of your current volume in answer to P. S. K. Malers, you direct him to break stones into small pieces and then to mix sand (sharp grit), etc. I have no stones on or near my place, and I wish to know whether river gravel which I have in abundance (from the size of a goose egg to fine sand) would answer instead. Also, will it make a sufficiently strong cellar wall, and if so, would cement mixed with lime be better for a cellar wall than cement without the lime?

J. G. K. asks: 1. Where can I obtain the exact standard measure of the American foot or yard? Is there any place or office in the city of New York where such a standard or model measure is kept open for the public? 2. Could some correspondent give me some practical details concerning the system of irrigation as practiced by the Mormons in Utah, and also about irrigation generally for agricultural and gardening purposes? 3. Is there not a kind of oak with edible acorns which may be used as food, or are acorns actually used as food? If so, where and how? I wish to know the botanical or other name and some characteristic description of such oaks and where they grow.

M. E. P. says: Can there be any such thing as a steam boiler that is absolutely safe? I do not claim to be an engineer myself; but suppose a boiler should be made in the usual manner except that the safety valve should be set on the top of another larger safety valve. For instance, the whole top of the steam dome might form a valve, fitted and made steam tight and arranged with a sufficiently long lever and heavy weights to stand an internal pressure of say one hundred pounds to the square inch, while the small safety valve was set to blow off at eighty. Would that be practicable? Or would several smaller ones attached to one boiler be of any use?

E. A. S. says: Nearly two years ago I tore up an old coal chute, that had been built for eighteen years, and found the sleepers and cross trees as sound as when first laid. The timber was laid in our common sand, and some of it was round, just as cut in the woods, with the bark on, and this was as sound as the rest. There were pine, hemlock, spruce and oak. The slack coal had worked through the cracks, and water had leaked through and formed a crust about six inches through. We had to use a pick to break through the crust. The earth was saturated for about two feet down and looked like iron ore. Could slack coal and sand be used to lay Nicholson pavement, and be cheaper and better than the old process? And would it last till it were out, without regard to the kind of timber used? I claim that this can be done, and, if so, the discovery of the same.

ANSWERS TO CORRESPONDENTS

Owing to the illness of one of our editors, the replies to several of our correspondents relating to chemical subjects have been delayed, but will shortly be given.

F. A. S. will find particulars of cupro-ammonium on p. 177, vol. 28.—P. H. H. and J. C. C. will find directions for hardening taps and dies on p. 91, vol. 28.—G. T. S. can repair his leaky tin roof by following the directions on p. 139, vol. 28.—W. V. C. and M. C. M. will find the directions for polishing wood, given on p. 72, vol. 26, sufficient for the purpose.—W. H. G. will find the subject of preserving eggs practically discussed on p. 107, vol. 25.—C. R. asks how to brown gun barrels. Answer: Read the articles on pp. 154 & 266, vol. 26.—W. M. will find the process for bluing steel described on p. 10, vol. 25.—W. P. B. and J. P. C. will find ample directions for repairing rubber boots on p. 155, vol. 26.—J. A. E. asks how to join heavy gum belting. Answer: Read the two articles on p. 27, vol. 28.—G. R. and others will find the Gramme magneto-electrical apparatus described and illustrated on p. 410, vol. 26.—F. F. will find practical directions for making an Aeolian harp on p. 390, vol. 26.—M. B. will find a recipe for a pickle for tempering mill picks on p. 106, vol. 25.—E. K., F. T. J., and W. H. W. will find the subject of whitewashing fully discussed on p. 122, vol. 24.—A. K. will find a recipe for transparent cement on p. 41, vol. 27.—M. C. M. will be able to mount chromos, etc., by following the directions on p. 154, vol. 27.—T. E. C. will find directions for porcelaining iron ware on p. 149, vol. 28.—M. T. B. will find the power of steam boilers fully discussed in the last few numbers of the SCIENTIFIC AMER-

ICAN.—H. J. W. should read J. J. B.'s reply to W. D. O. on this page.—A. W. P. will find a recipe for marine glue on p. 202, vol. 28.—O. J. P. will find full directions for making and applying liquid bronze on p. 90, vol. 26.—R. S. W. asks for a covering for a flat roof. Answer: Consult our advertising columns.

E. C. M. is informed that the information on the regeneration of bone black is derived from the accounts published, by the inventors of the process, in Europe. It is not an extract from another publication.

J. L. L. asks what we mean by a saw of 16 gage. Answer: The blade of the saw is the thickness of No. 16 wire, according to the wire gage in ordinary use.

P. P. H. asks if any metal expands and contracts with various degrees of heat, as do mercury and alcohol. Answer: Yes; read S.'s letter on page 242 of our current volume.

P. P. H. asks if mercury can be kept in an iron vessel without affecting the latter. Answer: Yes; mercury is generally sold in cast iron flasks.

A. says: The following account of a boiler disaster appears in a Sacramento (Cal.) daily journal of March 25, 1873: "Last evening the residents were startled by a loud explosion, which was immediately followed by an alarm of fire. It became evident that some remarkable freak of steam had taken place, for an immense boiler, rent and torn by an explosion, lay across Second street, while an enormous hole in the third story of a brick house immediately opposite told of the terrific force with which it had been hurled. Investigation disclosed the fact that the boiler belonged to the Sacramento foundry of Wm. Guttenberger, 105 and 107 Front street, which had exploded with such force as to send it entirely through the end of the shop in which it was situated, across the alley, through a large yard, demolishing the fence on its road; then rising through the air, it passed entirely through three rooms and both front and back walls of a brick house before it had reached its lodging place in the middle of Second street. At first sight it seemed impossible that such an occurrence should have taken place without loss of life, and search was at once commenced amid the ruins for the injured, but none were found. It seems that the workmen had all left the foundry some time before, banking the fires and leaving everything apparently safe, and that all the occupants of the injured house were down stairs at the time. It is supposed that the explosion was of such a nature as to give a circular motion to the boiler in its flight, which, combined with the immense velocity, caused it to cut its way clean through all obstructions. The partition walls, furniture and brick walls were as completely wrecked and broken through as could have been done by the tools of a mechanic, while the boiler shop is a complete wreck of broken timbers. The most plausible theory of the cause of the explosion is that the fire got under way after the workmen had left, and thus generated steam sufficient to cause the accident. It was, however, impossible to arrive at any conclusions last night, and it will require removal and examination of the debris to-day to get at any accurate idea of how it occurred. A casual examination of the boiler shows that in some places it was very much worn and thin, some of the pieces left in its track being but little thicker than sheet iron." On going to the spot, immediately on reading the above, I found the boiler, as it lays on the street, to be about 10 feet long by 42 inches in diameter, 30 flues about 2 inches diameter. The front end is blown off and gone; one side of the boiler, from one end of the flues to the other, has been forced in by some cause, as if some great pressure had been applied to the outside. The flues are all forced close together at the center, while the ends of most of them remain in their proper places. Now what I wish to know is: How is it possible for the front end of a boiler to blow off and the balance of the boiler to follow with such force in the same direction? In this instance, the boiler was set facing the east; the front part is gone and the bottom we find about 300 feet east of where it was set, having struck the ground with the back end of the boiler first, showing that it must have made at least one half of a revolution endwise. I would as soon expect to see a cannon, when fired, go in the same direction as the ball, as to see a boiler follow up the end that is blown off. But perhaps you can give a satisfactory explanation of this mystery. Answer: We are quite as much at loss to account for this remarkable circumstance as is our correspondent, and hope that he will continue his investigation until he can give us more complete data upon which to base an opinion. Is there no mistake in the description given of the relative position of the boiler before and after the explosion, or some peculiarity of setting?

E. R. D. says: I have a 1/2 horse power oscillating engine; how large a boiler shall I want and what thickness should the iron be? The boiler is to be heated by a stove; will a barrel setting over the boiler, with a pipe running down into it, do for a feeder? Answer: We should make a tubular boiler having about a square foot of grate surface and 20 feet of heating surface. It would probably be 20 inches in diameter of shell, and should be made of iron about an eighth of an inch thick to carry 100 pounds steam. A properly constructed plunger feed pump should be attached to the engine. We should not approve of the barrel arrangement.

J. H. C. asks what per cent of the water supplied to a hydraulic ram can be returned to the point from which it fell? Does a ram give as good results under a given head of water as a turbine wheel? Answer: See article on page 257 of this issue.

L. & D. W. C. ask: How can we ascertain the quantity of power transmitted by belts of different widths, and pulleys of various diameters and speed? Answer: See the editorial columns of this issue.

W. H. C. asks: Would a pressure of steam hold up a column of cold water under the following circumstances: Suppose I have a tank of cold water 3 feet high connected by a 3/4 pipe to my boiler above the waterline (the tank also sitting above the water line), what pressure of steam, if any, would hold the water back; or would the cold water condense the steam and the difference in temperatures create a current and allow the water to run in the boiler under any pressure, the steam taking its place? Would the same result take place (the tank being closed and able to sustain the pressure of the steam in the boiler) if the tank were full as if half full? Or would the same result take place if the water in the tank was at a temperature of 30° as at 200°? Answer: A pressure of one and a half pounds would equilibrate that of the column of water. In the case supposed, the water, if cold, and if the pipe conducting it to the boiler were large enough, might condense the steam. If that were to occur, the water in the tank would then flow into the boiler with the same rapidity that it would issue from the pipe were the pipe led into the open air and a hole made in the top of the tank. The steam could only take the place of the water when the pipe was made of sufficient size to allow the steam to bubble directly up into the tank. With heated feed water, condensation of the steam would not be likely to