Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

NEW BOOKS AND PUBLICATIONS.

THE THEORY OF SHIPBUILDING (Theorie des Schiffes). By Victor Lutschaunig. Trieste, Austria: F. H. Schimpff. 1879.

The author of this work is the professor of shipbuilding at the Royal Commercial and Nautical Academy in Trieste, and has arranged the same to conform with the course of lectures he delivers at the above institution. All the formulas and results are computed by means of differential and integral calculus and analytical geometry, and only the theoretical part of shipbuilding has been regarded. The first chapter treats of the formulas, with their derivation, for the calculation of the center of displacement, the immersed section, and the entire displacement of a ship in or out of equilibrium. The second chapter treats of the meta center and the dynamical stability. The succeeding four chapters treat of the waves and their action upon the ship, the oscillations of ships in still water, and the resistance produced by the waves. The seventh and last chapter treats of the strength of the ship and the forces that tend to destroy the same. Formulas for obtaining the moment of inertia for different sections are annexed, and will be found of great use to every scientific shipbuilder.

Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from $1 to $5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

(1) J. H. asks for the process of bluing steel without heat. A. Mix finely powdered Prussian blue with rather thin shellac varnish; gently heat the steel, and apply the varnish.

(2) D. H. asks: What chemical difference is there between red and white arsenic? We use considerable red arsenic; the color makes no difference to us; would prefer white, on the score of economy, if the properties were the same as in the red. A. The red arsenic you refer to is probably realgar or orpiment—sulphides of arsenic. White arsenic is arsenious acid and contains no sulphur. They are both poisonous, but in other respects are quite different.

(3) J. P. L. asks how fast it is safe to run a ¼ inch power punch punching iron 3-32 inch thick, or how many holes ought it to punch per minute. A. It will be determined by the rapidity with which you can move and set the plate and clear the punch. Probably 18 to 20 per minute.

(4) J. L. P. asks: How many pounds of resisting air pressure would there be to the square foot, going at the rate of 20 miles an hour, at 30, at 40? A. At 20 miles per hour, 2 lb. per square foot; at 30 miles per hour, 4½ lb. per square foot; at 40 miles per hour, 8 lb. per square foot.

(5) B. G. V. writes: 1. We have a Bell telephone here which we sometimes use in connection with an Edison some eighteen miles distant. There is a continual crackling noise during the whole time they are connected. What is the cause and remedy for it? A. If your telephone line runs parallel with and near a telegraph line the crackling noise is probably due to currents induced by the telegraph line. The remedy will be to use an induction balance, or to shift your line to another set of poles. 2. In the quartz mill at this place there is a large rubber belt running on wooden pulleys, on which there is a large amount of electricity generated. Can it be used to run an electric pen such as described in the SCIENTIFIC AMERICAN? A. No; frictional electricity is not adapted to the propulsion of machinery. 3. Will it answer the purpose of a battery and induction coil? A. It might possibly be used with a voltaic pencil, but it would not replace a battery and induction coil.

(6) W. R. writes: 1. I am to put a pump (the cylinder 2 inches in diameter) into a well 100 feet deep. Which should I use, 1 inch or 1¼ pipe? A. 1¼ inch pipe. 2. Will the additional weight or increase in the size of the column of water make any difference in the working of the pump, provided that it is operated in both cases at the same rate of speed? A. No. 3. Would it be preferable to locate the cylinder in the water (near bottom of well)? A. Locate pump within 16 to 18 feet of the water. 4. In case the larger pipe is used, it is necessary to lift a larger amount of water, and consequently an additional amount of power would necessarily have to be expended in operating the pump? A. No more power required.

(7) T. L. M. asks: How many pounds weight can be raised with a line 1¼ inches in diameter rove through a double and triple block and a snatch? A. For working strain, 1,800 lb. safely; maximum breaking weight, 9,000 lb.

(8) L. F. B. asks if an upright engine should be balanced by the drive wheel so that it will stop with the piston crank in any position. A. Yes, especially if it is run at a high velocity.

(9) D. M. S. writes: 1. I think of building a small steamboat, length 60 feet, 10 feet wide inside of hull, height of cabin about 7 feet at sides. She is to be of sharp build in front. Wish to take several families West in it; and supposing we went up the Missouri River as far as Montana, which would be best: side wheels, stern wheel, or a screw? What size screw propeller should it have? What horse power engine will I need? A. A stern wheel boat, 60 feet by 12 to 14 feet beam, and 3½ feet deep, 2 engines, 8 inch cylinder by 2½ feet stroke. 2. Would it be safe to undertake such a trip with such sized boat as this? A. We think, if properly built, she would be safe for the trip proposed.

(10) W. H. P. writes: I am thinking of building a canoe such as is described by "Paddlefast" in SUPPLEMENT, No. 39, page 618. There are some things about it that I do not understand. 1. Ought the stern post to be perpendicular to the keel (like Fig. 36, page 471, No. 30), or curved like the stern (same fig.)? A. Yes, perpendicular, or nearly so. 2. Would it not be just as well to plank it with ¼ inch cedar as ½ inch? A. ¼ inch thick would spring under every strain and be likely to leak, and it will not hold fastenings so well as ½ inch. 3. Could you beat to windward with full sail (2 sails) and a leeboard? A. Yes, if properly modeled. 4. How fast would the boat probably sail before a fair wind? A. Depends upon spread of sail and force of wind.

(11) W. F. asks which part of a wheel (that is, the outside) turns the fastest when the wheel revolves: if one portion travels through a greater space than another, please state why. A. On the periphery all points have the same speed.

(12) G. M. A. writes: Here, in latitude 40° north, in summer, about June 21, the sun apparently rises in the extreme northeast and sets in extreme northwest, while at noon it is south of us. Please explain. A. The effect is due mainly to the curvature of the earth.

(13) F. J. N. asks how to make a cheap grade of Babbitt metal. A Melt separately 4 lb. copper, 12 lb. tin, 8 lb. regulus of antimony. Pour the antimony into the tin, then mix with the copper, away from the fire, in a separate pot, and add 12 lb. more tin.

(14) F. C. asks how to bleach straw: the process by sulphur, that by chloride of lime and sulphuric acid, also any other processes with which you may be acquainted. Does the straw require any preparation for the before named processes; and if so, what? Among straw bleachers, what is the cheapest and most speedy method of obtaining a satisfactory result? A. Straw goods are bleached by submitting them to the action of the vapor of burning sulphur—or better, to the vapor of burning bisulphide of carbon. The straw, which must be perfectly clean, must be well moistened with pure soft water before submitting to the sulphuric oxide. The bleaching is carried on in tight wooden sheds. Straw may be bleached by chlorinated lime, but the fiber is liable to be somewhat injured thereby. Moisten the goods thoroughly in a strong aqueous solution of the bleaching powder (defecated), and then pass them through a bath of sulphuric acid diluted with about 20 parts of soft water. Repeat if necessary, and finally rinse thoroughly in water containing a small quantity of sulphur or hyposulphite of soda.

(15) J. M. W. asks (1) how sugar is made from corn. A. The starch is separated from the mashed meal by a process of washing. Good corn yields about 25 lb. of starch per bushel of corn. The starch is boiled with dilute sulphuric acid, which gradually converts it into glucose or starch sugar. When the conversion is completed a sufficient quantity of chalk or marble dust is added to neutralize and precipitate the acid, and after defecation and filtration the saccharine liquid is boiled down and crystallized. 2. How much will one hundred lb. of corn make? A. About 45 lb. dry sugar. 3. What is the expense per lb.? A. The cost of manufacture depends somewhat upon the scale on which the business is conducted. Starch sugar is produced at a cost much below that of cane sugar.

(16) Z. C. M. writes: I wish to make a composition for making the ornaments on stove patterns. I have tried camphor, whiting, and sulphate of potash, but did not succeed. I have seen the kind they use, and it smells very strongly of camphor; to use it they simply steam it, and press it into the mould. A. The following composition is commonly used: Soften 12 lb. of good glue in water enough to cover it, then heat until the glue is dissolved. Melt 7 lb. of resin, ½ lb. of pitch, and 2½ pints of linseed oil together. Stir the hot glue solution into this and add enough whiting to thicken. It should be mixed in small quantities and used at once; otherwise it will require steaming before it can be used.

(17) R. M. writes: I would like a book on poisons and their antidotes; can you recommend one? A. You may consult "Horsely on Poisons." 2. What can I put in my water barrels to purify the water? It has to stand a few days stagnant until it is used. I carry it from the hydrant some distance off, and it gets bad in three or four days. A. Try a charcoal filter. 3. Will chickens or domestic fowl eat ordinary poisons, such as strychnine, arsenic, phosphorus, or poisonous acids, mixed with feed? A. Yes.

(18) H. R. L. asks: 1. Can you recommend a standard work on butter and cheese making, and the breeding and selection of profitable stock? A. Willard's "Practical Butter Book," Willard's "Practical Dairy Husbandry," and "Youatt and Martin on Cattle." 2. Can you give an antiseptic to prevent milk from souring within a reasonable time without impairing it for family use? A. The double borate of potassium and sodium has been recommended for this purpose.

(19) C. H. G. asks: What preparation of varnish or shellac will do to put on a celluloid comb and brush which I have painted in water colors? I want something to give a glaze to the decoration, and that will not injure the celluloid, at the same time to make the painting durable and handsome, as the set is a very fine one. A. The ordinary pale amber or picture varnish will doubtless answer your purpose admirably. The "negative varnish" used by photographers may be used instead.

(20) G. W asks: 1. What form of carbon other than simple powdered charcoal is best for a water filter? A. Crushed willow charcoal, well and recently burned, is preferable. 2. Can a carbon filter be cleaned or renewed without taking apart, that is, by reversing the current of water through it? A. Yes, in a measure, but it is better to renew the charge. 3. How long can iron scraps be used in a filter before requiring renewal? A. The iron should be replaced when it becomes badly oxidized. 4. Does the carbon (animal or vegetable) remove organic matter from water? A. The carbon alone cannot be depended on to remove all of the organic matters, especially if the filtration is permitted to proceed rapidly.

(21) M. H. T. asks: 1. What is the best metal for a pan for galvanizing? A. Cast iron is generally employed. 2. Does a cast iron pan make more dross than a wrought? How would cast steel do? A. The difference is slightly in favor of wrought iron.

(22) R. B. R. asks: Would it be wrong in any way or dangerous to run a lightning rod vertically through the center of a chimney smoke flue, and embed the ground end under bottom of chimney in lieu of running it along the angles of roofs and sidmg outside? Flue is 30 feet high and 20 inches by 8 inches section. Also, would it, if proper, be necessary to connect stove pipes, registers, or other iron or metal attachments? A. The object of arranging the rod on the roof angles is to afford conduction in case the lightning strikes at the roof You can safely run the rod down the chimney as you propose, and also connect stove pipes and iron work therewith. But remember that no lightning rod can be considered as a protection unless its bottom end connects with a large extent of conducting material placed underground. For example, if there is a metallic water pipe or gas pipe, connect the bottom of the rod to it by soldered joint. If there are no such pipes, then extend your rod, say fifty feet, underground, in a trench leading away from your house; and carefully embed the rod in coal dust or charcoal, placed in the trench. The deeper you can conveniently make the trench the better. Coal dust, hard or soft, or charcoal, all are good conductors of electricity.

(23) L. K., Jr, writes: The water that we are using to supply the boilers of our engine is very hard and produces a very thick scale of lime which is very hard to remove with a pick. About a day before stopping to clean boilers we have used about one pound of refined catechu by putting it in the heater and pumping it into the boilers with the feed water; it is effectual in loosening all the scale, and there is very little labor in cleaning boilers. Will it be injurious to the iron to continue the use of the same? A. Used in moderation no injury will result. Catechu or cutch is very frequently used for this purpose.

COMMUNICATIONS RECEIVED.

What is Light? By Dr. G.
Boiler Explosion. By A. O. G.
On the Steam Engine. By J. N. W S. D.

[OFFICIAL.]

INDEX OF INVENTIONS

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July 29, 1879,

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