HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(10539) E. H. asks: Would you kindly advise me, through your notes and queries column, relative to the following, viz.: I desire to protect my country residence from the effects of lightning. My house is located on a point of land which is surrounded by water. House is built upon rocks with a covering of about six feet of earth, about 18 feet above normal high tide; the drain and soil pipes are 6 feet under ground and drain into the water, being constantly covered by water. The house is a wooden structure (four-story), with a concrete foundation, having doors and windows screened with copper wires. The roofs and drain pipes are made of copper. Have several dormer windows and two projecting chimneys. Height of house about 60 feet at its highest point. I propose to erect a 70-foot flagpole distant about 125 feet from the house, imbedded in a rocky cement foundation, which flagpole I propose to protect with a braided or many-strand copper conductor tipped by an iron rod having the usual gold-pointed lightning rod. The flagpole wire to be properly grounded or imbedded in moist earth. Some authorities claim that this would be the best possible protection against lightning. What I desire to know is, would you also protect the several prominent projecting or angular points of the house with a similar lightning rod and conductor, and should these latter be insulated from the house proper, or should they be grounded on the house structure as advised by some western lightning-rod experts? I fully understand the physics of a discharge of lightning. The only question arising is: Should the conductor be insulated from or grounded on the house structure proper? Do I need extra lightning-rod precautions, because of the fact of the protected flagpole? A. If we had your house we should place upon all gables, and high points of the roof, rods rising 3 to 4 feet above the roof, and over the chimney tops a curved copper wire across each way from corner to corner. All these should be connected to the copper of the roof, and so by way of the roof and drain pipes with the water. We should also carry the stranded conductor from the flagpole into the water, as you perhaps plan to do. Lightning rods do not need to be insulated from the building, but should be closely connected to it. Of what use can a small glass insulator be in keeping electricity from the building four inches, perhaps, away when it has already overcome the resistance of a half mile of air? The flagpole does not afford sufficient protection to the house. No one lightning rod can protect a house of any size.

(10540) C. B. T. asks: I have been trying to make a touch spark coil for a gasoline engine but it fails to give a spark much larger than the batteries alone. I took a thin brass pipe filled with iron wires for my core, 6 inches long by 1¼ inch diameter, then forced on two wooden ends and wound on four pounds No. 14 magnet wire in the usual manner. It makes just as large a spark on snapping the wires apart, with the core out as with it in. I know the batteries are all right because they give a fine spark with a factory-made coil. Could the trouble be with the brass tube? Could you suggest a cause of the trouble? Also have you any copies of "Home Mechanics for Amateurs," and at what price? A. The trouble with your coil probably lies in the brass tube. When the current passes and is interrupted in the primary currents are generated in the brass tube which act to destroy the action of the current upon the secondary. Such a tube is commonly used in a medical coil, to cut down the current and enable one to adjust it to suit the case under treatment. If the tube were split along one side the trouble would disappear. It is not usual to have a metal tube for winding the coils. Hard rubber, wood or paper is commonly used. We send "Home Mechanics" for $1.50.

(10541) H. P. A. asks: Will you please give directions for making a spark coil for gas lighting? Upon what principle does such a spark coil act? A. A spark coil for gas lighting may be made from the following data: Core, 8 inches long of No. 18 soft iron wire in straight pieces. Cover with brown paper and shellac. Put wooden ends firmly upon the core to act as ends of the spool for the winding. Wind 13 layers of No. 16 double cotton-covered copper magnet wire in even layers on the core. This coil with 3 to 5 dry cells will give a fat spark on breaking the circuit. Such a coil acts by self-induction. When the circuit is made, a current flows through the coil from the battery, and an induced current flows through the same coil, but in the opposite direction to the battery current. When the battery current is interrupted, an induced current is produced in the coil in the same direction as the battery current. These two currents in the same direction produce the strong spark which is seen when a current through a coil is interrupted.

NEW BOOKS, ETC.

MENDELISM. By R. C. Punnett. Cambridge: Macmillan & Co., 1907. 32mo.; 84 pages. Price, 80 cents.

That Mr. Punnett's admirable little book on Mendelism should have passed to a second edition speaks well for the rapid advance which the new ideas of breeding, heredity, and the origin of species have made in recent years. This reprint differs from the original book in so far as it contains a new discussion of dihybridism and illustrations which explain this series of phenomena. Although so small a book can hardly discuss with thoroughness the great mass of facts which have been accumulated of late years by biologists, it gives a very clear, straightforward explanation of a law which was discovered long before Darwin advanced his epoch-making views, and the correctness of which is only now receiving recognition.

STEAM TURBINES. PRACTICE AND THEORY. By Lester G. French. Brattleboro, Vt.: The Technical Press. 8vo.; cloth; 418 pages, ill. Price, $3.

It is during the last five years only that the steam turbine has been raised to a degree of efficiency that makes it of commercial value. For the nine years previous to July, 1906, Mr. French was editor-in-chief of Machinery, so that his knowledge of turbines covers all the questions that arose during the entire period of their active development. The book commences with a chapter on Steam Turbine Principles, showing in an easily understood way how the energy of steam in a jet is arrested and appropriated by turbines of the distinctive types. The second chapter illustrates some of the Early Steam Turbines, and is designed to acquaint would-be inventors with what has been already attempted and accomplished, and to warn them from alluring but misleading paths. Several chapters descriptive of the different types are followed by 89 pages devoted to Steam Turbine Performance, giving the results of various tests, comparisons with the performance of reciprocating engines and considerations of the effect of vacuum and superheating. Chapter IX is a compilation of various Experiments on the Flow of Steam, followed, after a consideration of Steam and its Properties, by a chapter of Calculations on the Flow of Steam. These chapters, with that on Turbine Vanes, are necessarily somewhat mathematical, but the difficulties have been smoothed away as much as possible. A short chapter treats of Bodies Rotating at a High Speed, explaining the problems involved in balancing, and Efficiency and Design, the Commercial Aspect of the Turbine, Care and Management, Condensing Apparatus, and the Status of the Marine Turbine receive consideration in separate chapters. The book closes with a statement of the status of marine turbines, and has an apppendix containing curves showing the kinetic energy of a steam jet in foot-pounds, the velocity of a steam jet, and tables of the properties of saturated steam. The book as a whole is not above the comprehension of the average reader and will convey to its student an excellent grasp of the principles involved in turbine engineering and what has been done toward their application.

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