Notes and Queries.

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 This is for our information and not for publication.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.

(9225) E. T. R. says: 1. What would you figure the indicated and actual horse power of 3½ and 6 by 5 compound marine engine, running at 500 revolutions per minute on 150, 200, 250, and 400 pounds pressure, cut-off at 5-6 stroke? A. We estimate the indicated power of your compound engine at 200 pounds initial pressure and 500 revolutions per minute, at 40 horse power. At other initial pressure, in proportion to the pressure. 2. Can you give me a formula for finding the minimum thickness of cylinder walls for any pressure? A. The thickness of small high-pressure walls of cylinders should be 1-7 their diameter, and for low-pressure cylinder walls 1-10 their diameter. 3. If this engine were put into a boat 40 feet long, what would be proper size of screw to propel it at maximum speed, and what style of boat would give best results in that line? A. The engine and 40-foot boat should have a propeller 30-inch diameter, 56-inch pitch. The boat should be 7½ feet wide, with fine lines, and should draw 36 inches in depth at the stern. 4. Would it be practicable to put two engines into same boat and use two screws? What would be the maximum speed? A. We certainly do not advise the use of two engines and screws in a small boat. You should make a speed of 10 miles per hour. 5. What size of water-tube boiler (smallest possible) would be required to run engines at pressure mentioned in query 1, that is, what grate area and heating surfaces? A. You will need a boiler with 200 square feet heating surface and grate area 16 square feet.

(9226) E. F. P. says: Am I right in my opinion that the elementary substance selenium is, when lighted, a conductor of electricity, and when not, non-conductor? I mean that in darkness it is a non-conductor. Would you kindly inform me where I can obtain it, in what form and at what price (approx.) for ca. 1″ and 0.05′ thick? A. You can find the fullest description yet published of the properties and preparation of selenium in the SCIENTIFIC AMERICAN SUPPLEMENT No. 1430, price 10 cents. Selenium is a non-metallic element, a non-conductor of electricity, but which has its resistance reduced from five to twenty times in the sunlight. The paper referred to describes experiments and apparatus for exhibiting its peculiar properties. Any dealer in chemicals can supply it.

(9227) F. H. S. writes: 1. I inclose herewith what I take to be a natural curiosity. The little sheet that so resembles a piece of mechanically made wood pulp is a portion of a strip 13 inches long, found in a fissure or rift in a spruce tree. The constant grind of the two sections of tree as they swayed in the wind may have made the formation, or product of worms and the admixture of water in the way of rain, and the same process of grinding may have resulted in this peculiar production. What do you think? A. The piece of paper made by macerating spruce fiber by the rubbing together of the two parts of the split trunk is very interesting. There would not appear to be any reason why it should not be formed under such conditions. 2. One day I was standing on the shore of the St. John River, and noticed an unusually fat black cricket, seemingly determined on suicide. It sprang into the water, and I fished it out with my cane; it skipped in again and again. Seeing its determination to remain, I watched to see what it would further do. The cricket produced what, as a boy, we knew as a "hair snake," the peculiar monster common in puddles. Have you ever heard of this before? If so, please explain. A. The voiding of a Gordius, or hair snake, by a cricket is also an occurrence which is probably not often witnessed except when the insect is in captivity for observation. This little worm, erroneously thought to be a transformed horsehair, spends a part of its life in locusts and other insects, and when it is prepared for the change, it merges into the outer world. A full account of its transformations may be found in Packard's Zoology, under the genus Gordius, and probably also in books of a similar character.