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THIRTEENTH ANNUAL REPORT OF THE BUREAU OF STATISTICS OF LABOR AND INDUSTRIES OF NEW JERSEY.

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TABLE OF CONTENTS.

- 1. Elegant plate in colors of a cottage at Short Hills N. J. Estimated cost, \$5,000. Perspective elevation, floor plans, etc.

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Notes & Queries

HINTS TO CORRESPONDENTS.

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 This is for our information and not for publication.

(4013) W. E. W. asks about crystallized boron, its demand and price per gramme or ounce. If there is a concern that makes a specialty of manufacturing it, would it be enough in demand to take the place of the diamond in some of its uses in the arts?

(4014) B. P. B. asks: Please inform me if at any period of the year the sun setting in Alaska will be rising in Maine. Also if the south pole is as cold as the north pole, and if a compass be taken below the equator, will it still point north?

(4015) B. A. C. writes: I have constructed a telegraph line about a mile in length, but I am unable to tell how many batteries to use.

(4016) A. D. D. asks: 1. What is the cause of the detonation when a fuse burns out in the fuse box of an electric car? A. The fusion is so sudden as to amount practically to an explosion.

(4017) J. S. writes: I have been making a magnetic key similar to one described in "Experimental Science," Fig. 465, but cannot make it induce any noticeable current in a detector such as described on page 395.

(4018) W. Mc.P. asks: 1. What is the principle of the Babcock fire extinguisher? A. The large vessel is charged with water and sodium bicarbonate.

bonate. Above it a corked bottle of sulphuric acid is supported. A short hose with stop cock and nozzle connects with the liquid. To use it a handle is turned, breaking the acid bottle. The acid falls into the solution and sets free enough carbon dioxide to generate high pressure in the vessel, which is tightly closed.

(4019) E. R. E. asks: Can you explain the phenomenon of a wagon or carriage wheel turning backward when it passes over an icy or slippery place? I have witnessed it many times, and to-day, as a heavily loaded coal wagon passed along, one of the rear wheels, as it touched a slippery place, several times reversed about one-eighth of a circle.

(4020) F. H. R. asks: What amount of electric current would be required for heating 100 feet of No. 30 German silver wire up to 212° Fah.?

(4021) J. S. H. asks for the method of finding the mantissa of logarithms. Most mathematical works on the subject of logarithms state the use of tables of logarithms, but not the construction.

(4022) C. H. M. asks: 1. Has there ever been any theory advanced in respect to the significance of Bode's law for planetary distances? A. Bode's law is only an approximate relation, and breaks down in the case of Neptune.

(4023) W. E. S. asks: 1. What is the difference between the electricity used for illuminating purposes and static electricity generated by friction and collected in a Leyden jar?

(4024) W. P. B. asks: Can you please give the value in cubic feet and in gallons of the statute inch of water of Colorado and of California?

(4025) J. C. F. A. asks: If the ordinary steam engine only produces in power about 30 to 35 per cent of the energy of the coal, how is the loss of 65 to 70 per cent divided between the boiler and engine?

(4026) F. W. S. asks: What amount of pure gold is required to be added to raise 100 dwt. of 18 karat gold to 20 karat gold. Please give rule and example.

(4027) G. L. H. asks: 1. How many cells of the Fuller battery will be required to run the simple motor No. 641? A. It will require about 20 cells.

(4028) Inquirer writes: I am interested in Mr. Wightman's method of fixing the paste for the positive plates of storage batteries.

(4029) W. J. A. asks: What is the accepted theory as to the origin of the salt in the ocean? And is it increasing or diminishing? A. It is generally conceded that the saltiness of the sea was at first partially derived from the combination and precipitation of the vapors of its constituents during the earliest of the geological ages.

(4030) M. A. L. says: Would be pleased to have you state the composition of the strongest known castings. The tensile strength of same. Also, supposing a tubular steel shaft 2 1/2 inches diameter outside by 1/4 inch thick by 2 feet long, resting in a suitable bearing, and a pulley 4 feet diameter attached to each end, one pulley made fast. What safe working load could be suspended on the circumference of the other pulley?

(4031) Reader, Selma, Ala., asks why the drift wood keeps in the center of a rising stream, and why it goes to the banks when the stream begins to fall? A. The high and steep banks at Selma retard the stream at its edge and cause a whirl that sets the surface toward the center of the stream during high water.

(4032) G. L. F. asks: 1. How much pressure per square inch will a boiler stand, of following dimensions: diam., 12 to 14 inches; thickness of shell, 1-8 to 3-16 inch; about 3 feet long, with locomotive type fire box? Boiler well riveted.

(4033) C. E. T. says: Can you tell me the reason why the pipe leading to a steam gauge of boilers has the coil of pipe? Is there any advantage in it, or is it there for looks, or some other less important reason?

(4034) J. McD. says: When the hot water faucet at sink is opened, a great rattling noise is produced in boiler, which is of copper, 40 gals., and continues until faucet is shut off again, then producing a sudden sharp click in boiler; all is quiet until hot water faucet is used again, when the above is repeated; pipes to water back in range are all run correctly and are not trapped.