

fire the stove invariably smokes although the two chimneys are known to draw equally well, and no difficulty was experienced on lighting the first fire.

(a) Explain the cause of this.

(b) If a window is now opened, the smoking instantly ceases. Account for this.

(c) If the window had been opened before the fire was lighted, would the stove have smoked? Give reasons for your answer.

(d) If the window is closed after the fire has been well started, why does the stove not smoke?

3. (a) A fall of rain in cold weather frequently causes the temperature to rise considerably. Explain the reason of this, and describe a simple experiment to illustrate the same principle.

(b) If some oil of turpentine is dropped upon a flagstone and ignited the flame will soon be extinguished, the rest of the oil remaining unburnt; but if it is poured upon a block of wood, the whole of the oil burns away. Explain the cause of this.

B.

4. Describe experiments to show that solids, liquids and gases transmit sound vibrations.

What properties of matter affect the velocity of sound? Give illustrations.

5. On hearing with unusual distinctness steam whistles, bells, and other sounds, which are ordinarily either faint or inaudible, the listener concludes that it will rain soon. Explain the scientific grounds for his conclusion.

C.

6. If an electrical current be caused to heat a long thin platinum wire to dull redness, and a portion of the wire be cooled by applying a piece of ice to it, the remainder of the wire will glow much more brightly than before; whereas if a portion be heated by a spirit lamp the reverse effect takes place. Explain fully.

7. Explain the construction of the electric lamp and the production of the electric light.

8. Describe experiments to show

(a) That there are two kinds of electricity;

(b) That electrification is confined to the external surface.

D.

9. Explain the undulatory theory of light. Apply it to explain the cause of refraction.

10. Describe an experiment to show that the angle of reflection is equal to the angle of incidence.

11. An object is placed beyond the centre of curvature of a concave mirror. Show, by a carefully constructed diagram, the position of the image.

CONTEMPORARY LITERATURE

BOOKS RECEIVED.

The Johns Hopkins University Register for 1888-9.

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The Beginner's Book in German. (Boston: Ginn & Co.)

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Die Journalisten. Freytag. By Prof. Toy. (Boston: D. C. Heath & Co.)

Ear and Voice Training. By N. A. Calkins. (New York: E. L. Kellogg.)

Classics for Children. Two Great Treats. Grote and Ségur. (Boston: Ginn & Co.)

What Manual Training Is, and How It May Be Best Conducted. (Boston: D. C. Heath & Co.)

Syllabus of Lectures in Anatomy and Physiology. By Prof. Stowell. (Syracuse: C. W. Bardeen.)

French Life in Letters. By Mrs. Molesworth. (London: Macmillan & Co.) *French Course.* By G. H. Williams, M.A. (London: Moffatt & Paige.)