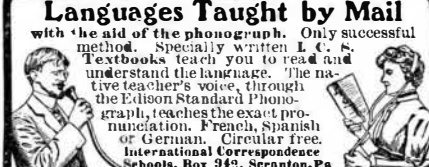






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(8500) E. O. M. writes: I have two textbooks on physics which disagree. Mr. Spottiswoode, of London, had an induction coil made which gave a 42-inch spark. One says it required 5 Grove cells to give the 42-inch spark; the other says 30 Grove cells were required. Which is right? A. The statement in Gordon's "Electricity" is that with five Grove cells the coil gave a spark 28 inches long; with 10 cells the spark was 35 inches, and with 30 cells it was 42½ inches long. 2. What difference of potential was required to force the spark across the gap of 42 inches? A. We do not know. Probably hundreds of thousands of volts.

(8501) J. C. A. asks: Please inform me how to make a strong magnet of Jessup steel. I have tried to make some ½ inch square by 3 inches long, straight bars, by passing them through a spool of wire with a 300-volt current, by which they were strongly magnetized, but lost almost all magnetism in about three weeks. How can I make such magnets which will retain their strength for a long time? A. Heat the bars to be magnetized to a red heat and plunge them into water. They are then to be magnetized. Straight bars do not retain magnetism well. They should lie in pairs with opposite poles toward each other, side by side, not end to end, or else in pairs with an iron keeper across the poles. They may be laid four in a square with opposite poles against each other. Laid down alone without keepers, the magnetism is rapidly lost.

(8502) S. S. asks: Please tell me whether there is any such thing as an absolute vacuum, and if so, how is it produced? A. It is claimed that an absolute vacuum has been made by chemical means. The gas remaining after exhaustion had been carried as far as possible by means of pumps, was absorbed by chemicals and the space was then empty of gas, a vacuum. Another method has been described. Fill a hard glass tube closed at one end with soft glass. This on solidifying presents the appearance of a glass rod, solid throughout. When this is connected to an air pump and heated so that the soft glass melts, the melted glass will drop from the top of the tube, just as the mercury does in the barometer and Torricellian experiment. Upon cooling the soft glass solidifies again, leaving a complete vacuum in the upper part of the tube.

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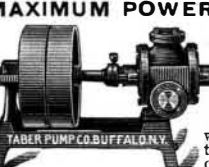
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