

June 10, 1842

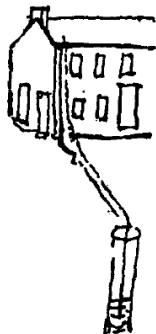
"RECORD OF EXPERIMENTS"

Henry Papers, Smithsonian Archives

June 10th 1842

First¹ Induction from a thunder cloud²

Agreeably to the suggestion given at the bottom of page 263³ I connected by soldering a copper wire (bell size) to the tin roof of our house and passed the lower extremity into the water of the well. This was effected by fastning a cylinder of lead to the end of the wire and passing this through a hole in the cover near the pump of the well. The wire was then divided near the window of the study and a compound spiral inserted. This was formed of 6 strata of wire each consisting of 40 spires and insulated by cement.⁴



After this arrangement was completed (on monday last)⁵ I waited with some anxiety for the appearance of a thunder cloud but none appeared until last evening when I observed before going to bed a few very distant and faint flashes of light but too distant to produce any effect: they must have been from a cloud at the distance of 100 miles. I placed a needle no 5 in the spiral and then went to bed. At a little before three o'clock I was awakened by a storm of rain and heard several distant discharges of lightning. I did not rise but in the morning I found the needle strongly magnetic in the direction which indicated a current upwards. This result is precisely in accordance with my anticipations and perfectly analogous to the experiment described page 263.⁶

*The deflection of the needle magnetized by the flash was 23 1/2° minus.*⁷

Commenced a series of experiments with needles n^o 5 and a fine wire spiral (plated) containing about 200 spires. I commenced with 5 spark and increased the charge to 30 when I obtained a *minus* polarity strongly de-

¹ This word appears to be a later addition to the heading, probably to distinguish this experiment from that of June 13, below.

² On the opposite page is the running head: "experiments with the spiral." This refers to the experiments described in the final paragraph of the entry.

³ See above, "Record of Experiments," May 28, 1842, fourth paragraph.

⁴ An illustrated description of Henry's apparatus for this experiment is contained in his article "Meteorology in Its Connection with Agriculture, Part V: Atmospheric Electricity," *Report of the Commissioner of Patents, 1859:*

Agriculture (Washington, 1860), pp. 477-478.

⁵ June 6.

⁶ Henry is referring to the experiments described in the second and third paragraphs of the "Record of Experiments" entry of May 28, 1842, above.

⁷ Henry reported his success in detecting induced currents from atmospheric electricity in the last paragraph of "Contributions V: Induction from Ordinary Electricity; Oscillatory Discharges." He later drew upon this work when called upon in 1846 to consider the effect of lightning on telegraph lines. *APS Proceedings, 1843-1847, 4:265.*

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veloped. I however could get this but once although I experimented several times with the same charge. The weather however is so unfavourable for experiments of this kind that the battery will not hold its charge and therefore there is some uncertainty relative to the exact quantity of electricity which produced the above result

TO W. A. SMITH¹

*Joseph Francis Papers, Division of Naval History,
National Museum of American History, Smithsonian Institution*

Princeton June 10th 1842

My Dear Sir

I am just now in the midst of a new series of electrical researches and find myself much in want of a small quantity of copper bell wire. I am therefore obliged to apply to you and ask that you will forward me by the rail way as soon as convenient about 10 or 12 lbs of the article. Please put the bill in the package and I will send the money immediately or pay it to your Brother.²

Come on to Princeton & I will show you my new results. In haste yours
Truly

Joseph Henry

I have made magnets by a flash of Lightning from a cloud at the distance of several miles.

J H

¹William Asa Smith (1820-1894), an 1838 graduate of Princeton, was in the dry goods business with his father in New York City. *Princeton Catalogue*, p. 155. William Edward Schenck, *Biography of the Class of 1838 of the*

College of New Jersey (Philadelphia, 1889), pp. 140-142.

²Edward B. Smith, a sophomore at Princeton. Schenck, *Biography*, p. 141.

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June 11th (Saturday) [1842]

Repeated the experiments on the magnetization with the fine wire spiral. Commenced at 30 and went up to 150 the full jar of the jar. The weather is very fine to day for electrical experments and the battery holds the