

Matteucci,* Guillemin,† Wertheim,‡ Wartmann,§ Janniar,|| Joule,¶ Laborde,** Legat,†† Reis,‡‡ Poggendorff,§§ Du Moncel,||| Delezenne,¶¶ and others.***

2. In the autumn of 1874, I discovered that the sounds emitted by an electro-magnet under the influence of a discontinuous current of electricity are not due wholly to sudden changes in the magnetic condition of the iron core (as heretofore supposed), but that a portion of the effect results from vibrations in the insulated copper-wires composing the coils. An electro-magnet was arranged upon circuit with an instrument for interrupting the current,—the rheotome being placed in a distant room, so as to avoid interference with the experiment. Upon applying the ear to the magnet, a musical note was clearly perceived, and the sound persisted after the iron core had been removed. It was then much feebler in intensity, but was otherwise unchanged,—the curious crackling noise accompanying the sound being well marked.

The effect may probably be explained by the attraction of the coils of the wire for one another during the passage of the galvanic current,

* *Matteucci*. Inst., 1845, p. 315; Arch. de l'Électr., V., 389.

† *Guillemin*. Comp. Rend., XXII., p. 264; Inst., 1846, p. 30; Arch. d. Sc. Phys. (2d series), I., p. 191.

‡ *G. Wertheim*. Comp. Rend., XXII., pp. 330, 544; Inst., 1846, pp. 65, 100; Pogg. Ann., LXVIII., p. 140; Comp. Rend., XXVI., p. 506; Inst., 1848, p. 142; Ann. de Chim. et de Phys., XXIII., p. 302; Arch. d. Sc. Phys. et Nat., VIII., p. 206; Pogg. Ann., LXXVII., p. 43; Berl. Ber., IV., p. 121.

§ *Elie Wartmann*. Comp. Rend., XXII., p. 544; Phil. Mag. (3d series), XXVIII., p. 544; Arch. d. Sc. Phys. et Nat. (2d series), I., p. 419; Inst., 1846, p. 290; Monatscher. d. Berl. Akad., 1846, p. 111.

|| *Janniar*. Comp. Rend., XXIII., p. 319; Inst., 1846, p. 269; Arch. d. Sc. Phys. et Nat. (2d series), II., p. 394.

¶ *J. P. Joule*. Phil. Mag., XXV., pp. 76, 225; Berl. Ber., III., p. 489.

** *Laborde*. Comp. Rend., L., p. 692; Cosmos, XVII., p. 514.

†† *Legat*. Brix. Z. S., IX., p. 125.

‡‡ *Reis*. "Téléphonie." Polytechnic Journ., CLXVIII., p. 185; Böttger's Notizbl., 1863, No. 6.

§§ *J. C. Poggendorff*. Pogg. Ann., XCVIII., p. 192; Berliner Monatsber., 1856, p. 133; Cosmos, IX., p. 49; Berl. Ber., XII., p. 241; Pogg. Ann., LXXXVII., p. 139.

||| *Du Moncel*. Exposé, II., p. 125; also, III., p. 83.

¶¶ *Delezenne*. "Sound produced by Magnetization," Bibl. Univ. (new series), 1841, XVI., p. 406.

*** See London Journ., XXXII., p. 402; Polytechnic Journ., CX., p. 16; Cosmos, IV., p. 43; Glöesener — Traité général, &c., p. 350; Dove-Repert., VI., p. 58; Pogg. Ann., XLIII., p. 411; Berl. Ber., I., p. 144; Arch. d. Sc. Phys. et Nat., XVI., p. 406; Kuhn's Encyclopædia der Physik, pp. 1014–1021.