



## XLIII. Some experiments connected with the relations of caloric to magnetism

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To cite this article: John Murray Esq. F.L.S. M.W.S. (1823) XLIII. Some experiments connected with the relations of caloric to magnetism , Philosophical Magazine Series 1, 61:299, 207-207, DOI: [10.1080/14786442308644301](https://doi.org/10.1080/14786442308644301)

To link to this article: <http://dx.doi.org/10.1080/14786442308644301>



Published online: 29 Jul 2009.



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XLIII. *Some Experiments connected with the Relations of Caloric to Magnetism.* By JOHN MURRAY, Esq. F.L.S. M.W.S. &c.

*To the Editors of the Philosophical Magazine and Journal.*

IT has not been determined whether the deviation of the magnetic needle in M. Oersted's interesting discovery, to the east or west according as it is posited above or below the uniting wire of the Voltaic circle, is to be attributed to the *caloric* evolved, or the *electricity* developed.

The following experiments seem to prove that the *former* is the efficient cause of this declination; and, as connected with the relations of heat to magnetism, the short and simple detail may be deemed of interest.

I used a long and slender magnetic needle taken from a theodolite. It was freely suspended by a thread of flos silk attached to its centre, and depended from a brass stand.

On bringing the flame of a spirit lamp *eastward* of the south pole, it was primarily slightly *repelled* by the flame, and on the lamp being withdrawn the south pole moved *toward the east* to the amount of  $45^{\circ}$  declination, and then slowly retrograded to its former position.

The flame being introduced *westward* of the south pole, seemed to *attract* the needle; and on being removed, the south pole deviated still more considerably toward the *east*, and finally slowly returned to its proper station.

The lamp was next brought *westward* of the north pole, and the flame seemed in the first instance to *repell* it; when the lamp was withdrawn, the north pole moved toward the *west*, and the deviation amounted to  $70^{\circ}$ . After a proper interval it resumed its previous locality.

The flame, now brought *eastward* of the north pole, first exhibited an *attractive* influence; and on its removal the north pole slowly advanced *westward*, and at last retrograded.

The amount of the declination will of course vary, and will depend on the proximity and continuance of the flame.

The flame brought *under the centre* of the suspended needle, occasioned a *circular* motion.

I am, gentlemen,  
Your obedient servant,

Gloucester, March 1st, 1823.

J. MURRAY.

XLIV. *Re-*