

# Further Reading: Michael Faraday

## **General reading**

Geoffrey Cantor, *Michael Faraday: Sandemanian and Scientist. A Study of Science and Religion in the Nineteenth Century*, (London, 1991).

David Gooding, *Experiment and the Making of Meaning: Human Agency in Scientific Observation and Experiment*, (Dordrecht, 1991).

David Gooding and Frank A.J.L. James (eds.), *Faraday Rediscovered: Essays on the Life and Work of Michael Faraday, 1791-1867*, (London, 1985).

Frank A.J.L. James (ed.), *'The Common Purposes of Life': Science and society at the Royal Institution of Great Britain*, (Aldershot, 2002).

Frank A.J.L. James, *Michael Faraday: A very short Introduction*. (Oxford, 2010)

Alan E. Jeffreys, *Michael Faraday: A List of His Lectures and Published Writings*, (London, 1960).

## **Published books by Faraday, mainly collections of papers and lecture notes, some published after his death:**

*Chemical Manipulation, Being Instructions to Students in Chemistry*. (1827).

*Experimental Researches in Electricity, Vol I, II& III* (1837, 1844, 1855)

*Experimental Researches in Chemistry and Physics* (1859).

W. Crookes. ed. *A Course of six lectures on the Various Forces of Matter* (1860)

W. Crookes. ed. *A Course of six lectures on the Chemical History of a Candle*, (1861)

W. Crookes. ed. *On the Various Forces in Nature*. (1873)

*The liquefaction of gases* (1896.)

## **Published texts by Faraday**

The vast majority of Faraday's manuscripts, apart from letters, have been published on microfilm and cd. Frank A.J.L. James, *Guide to the Microfilm edition of the Manuscripts of Michael Faraday (1791-1867) from the Collections of the Royal Institution, The Institution of Electrical Engineers, The Guildhall Library [and] The Royal Society*, (2nd ed., Wakefield, 2001).

A typescript edition of Faraday's experimental notebooks has been published. Thomas Martin, *Faraday's Diary*, 7 volumes and index, London, 1932–36.

The complete correspondence of Michael Faraday is currently being compiled. Five volumes have been published with the sixth in progress. Frank A.J.L. James, *The Correspondence of Michael Faraday*, (London, 1991-2008).

## **In-depth reading:**

Ronald Anderson, 'The Crafting of Scientific Meaning and Identity: Exploring the Performative Dimensions of Michael Faraday's Texts', *Perspectives on Science*, 2006, **14**: 7-39.

Ronald Anderson, 'The Referees' Assessment of Faraday's Electromagnetic Induction Paper of 1831', *Notes and Records of the Royal Society of London*, 1993, **47**: 243-56,

Henry Bence Jones, *Life and Letters of Faraday*, 1st and 2nd editions, 2 volumes, London, 1870

Giovanni Boato and Natalia Moro, 'Bancalari's role in Faraday's discovery of diamagnetism and the successive progress in the understanding of magnetic properties of matter', *Annals of Science*, 1994, **51**: 391-412.

Brian Bowers and Lenore Symons, *'Curiosity Perfectly Satisfied': Faraday's travels in Europe 1813-1815*, (London, 1991).

- Z. Buchwald, 'William Thomson and the mathematization of Faraday's electrostatics', *Historical Studies in the Physical Sciences*, 1977, **8**: 101-136
- Geoffrey Cantor, 'Michael Faraday Meets the "High-Priestess of God's Works": A Romance on the Theme of Science and Religion' in Matthew Eddy and David Knight (eds.), *Science and Beliefs: From Natural Philosophy to Natural Science, 1700-1900*, (Aldershot, 2005), pp.157-170.
- Geoffrey Cantor, 'The Scientist as Hero: Public Images of Michael Faraday', in M. Shortland and R. Yeo (eds.), *Telling Lives in Science: Essays on Scientific Biography*, (Cambridge, 1996), 171-93.
- Geoffrey Cantor, 'How Michael Faraday brought law and order to the West End of London', *Physis*, 1992, **29**: 187-203
- Geoffrey Cantor, 'Educating the Judgment: Faraday as a Lecturer', *Bulletin for the History of Chemistry*, 1991, **11**: 28-36,
- Geoffrey Cantor, 'Faraday's Search for the Gravitoelectric Effect', *Physics Education*, 1991, **26**: 289-93
- Geoffrey Cantor, David Gooding and Frank A.J.L. James., *Faraday*, London, 1991.
- Elizabeth Cavicchi, 'Nineteenth-Century Developments in Coiled Instruments and Experiences with Electromagnetic Induction', *Annals of Science*, 2006, **63**: 319-361,
- B. C. Blake-Coleman and R. Yorke, 'Faraday and Electrical Conductors: an Examination of the Copper Wire Used by Michael Faraday between 1821 and 1831', *Proceedings of the Institution of Electrical Engineers*, 1981, **128A**: 463-71.
- Isobel Falconer and Frank A.J.L. James, 'Fame and Faraday', in Elaine Moohan (ed.), *Reputations*, (Milton Keynes, 2008), pp.85-122.
- June Z. Fullmer and Melvyn C. Usselman, 'Faraday's Election to the Royal Society: A Reputation in Jeopardy', *Bulletin for the History of Chemistry*, 1991, **11**: 17-28.
- Graeme Gooday, 'Faraday Reinvented: Moral Imagery and Institutional Icons in Victorian Electrical Engineering', *History of Technology*, 1993, **15**: 190-205.
- David Gooding, 'From Phenomenology to Field Theory: Faraday's Visual Reasoning', *Perspectives on Science*, 2006, **14**: 40-65.
- David Gooding, 'Mathematics and Method in Faraday's Experiments', *Physis*, 1992, **29**: 121-147
- David Gooding, 'Mapping Experiment as a Learning Process: How the First Electromagnetic Motor Was Invented', *Science Technology and Human Values*, 1990, **15**: 165-201.
- David Gooding, "'Magnetic curves' and the Magnetic Field: Experimentation and Representation in the History of a Theory' in David Gooding, Trevor Pinch and Simon Schaffer (eds.), *The uses of experiment: Studies in the natural sciences*, (Cambridge, 1989), pp.183-223,
- David Gooding, 'History in the laboratory: Can we tell what really went on?' in Frank A.J.L. James (ed.), *The Development of the Laboratory: Essays on the Place of Experiment in Industrial Civilisation*, (London, 1989), pp.63-82
- David Gooding, 'Experiment and concept formation in electromagnetic science and technology in England in the 1820s', *History and Technology*, 1985, **2**: 151-176,
- David Gooding, "'He Who Proves Discovers': John Herschel, William Pepys and the Faraday Effect', *Notes and Records of the Royal Society of London*, 1985, **39**: 229-44,
- David Gooding, 'Empiricism in practice: Teleology, economy, and observation in Faraday's physics', *ISIS*, 1982, **73**: 46-67
- David Gooding, 'A Convergence of Opinion on the Divergence of Lines: Faraday and Thomson's Discussion of Diamagnetism', *Notes and Records of the Royal Society of London*, 1982, **36**: 243-59
- David Gooding, 'Final steps to the field theory: Faraday's study of magnetic phenomena, 1845-1850', *Historical Studies in the Physical Sciences*, 1981, **11**: 231-75
- David Gooding, 'Faraday, Thomson, and the concept of the magnetic field', *British Journal for the History of Science*, 1980, **13**: 91-120,
- David Gooding, 'Metaphysics versus Measurement: the Conversion and Conservation of Force in Faraday's Physics', *Annals of Science*, 1980, **37**: 1-29.
- David Gooding, 'Conceptual and experimental bases of Faraday's denial of electrostatic action at a distance', *Studies in the History and Philosophy of Science*, 1978, **9**: 117-49.

- Stanley M. Guralnick, 'The Contexts of Faraday's Electrochemical Laws', *ISIS*, 1979, **70**: 59-75;
- Robert A. Hadfield, *Faraday and his Metallurgical Researches, with special reference to their bearing on the development of alloy steels*, (London, 1931).
- L. Hannah, *Electricity before Nationalisation: A Study of the Development of the Electricity Supply Industry in Britain to 1948*, (London, 1979),
- Edward Hare, 'Michael Faraday's loss of memory', *Proceedings of the Royal Institution*, 1976, **49**: 33-52
- P.M. Harman, 'Maxwell and Faraday', *European Journal of Physics*, 1993, **14**: 148-154
- Bruce J. Hunt, 'Michael Faraday, Cable Telegraphy and the Rise of Field Theory', *History of Technology*, 1991, **13**:1-19
- Bruce J. Hunt, 'Insulation for an Empire: Gutta-Percha and the Development of Electrical Measurement in Victorian Britain', in Frank A.J.L. James (ed.), *Semaphores to Short Waves*, (London, 1998), pp.85-104.
- Bruce J. Hunt, *The Maxwellians* (Ithaca, 1991)
- Frank A.J.L. James, 'Presidential address. The Janus face of modernity: Michael Faraday in the twentieth century', *British Journal for the History of Science*, 2008, **41**: 477-516.
- Frank A.J.L. James (ed.), 'Introduction' to *Christmas at the Royal Institution: An Anthology of Lectures by M. Faraday, J. Tyndall, R.S. Ball, S.P. Thompson, E.R. Lankester, W.H. Bragg, W.L. Bragg, R.L. Gregory, and I. Stewart*, (Singapore, 2007), pp.xi-xxv.
- Frank A.J.L. James, 'Reporting Royal Institution Lectures, 1826 to 1867', in Sally Shuttleworth and Geoffrey Cantor (eds.), *Science Serialized: Representations of the Sciences in Nineteenth-Century Periodicals*, (Cambridge MA, 2004), pp.67-79,
- Frank A.J.L. James, 'Faraday, Michael' in David Loades (ed.), *Reader's Guide to British History*, (2 vols., London, 2003), **1**: 489-91.
- Frank A.J.L. James, 'Harriet Jane Moore, Michael Faraday, and Moore's mid-nineteenth century watercolours of the interior of the Royal Institution', in James Hamilton (ed.), *Fields of Influence: Conjunctions of Artists and Scientists, 1815-1860*, (Birmingham, 2001), pp.111-128.
- Frank A.J.L. James, 'Michael Faraday and Lighthouses' in Ian Inkster, Colin Griffin, Jeff Hill and Judith Rowbotham (eds.), *The Golden Age: Essays in British Social and Economic History, 1850-1870*, (Aldershot, 2000), pp.92-104.
- Frank A.J.L. James, "'the civil-engineer's talent': Michael Faraday, science, engineering and the English lighthouse service, 1836-1865', *Transactions of the Newcomen Society*, 1999: **70**: 153-60
- Frank A.J.L. James, *The Royal Institution and the Royal Family 1799-1999*, (London, 1999).
- Frank A.J.L. James and Margaret Ray, 'Science in the Pits: Michael Faraday, Charles Lyell and the Home Office Enquiry into the Explosion at Haswell Colliery, County Durham, in 1844', *History and Technology*, 1999, **15**: 213-31.
- Frank A.J.L. James, *Faraday, Maxwell and Field Theory*. In Frank A.J.L. James (editor), *Semaphores to Short Waves* (1998), pp.71-84.
- Frank A.J.L. James, 'Reality or Rhetoric? Boscovichianism in Britain: the Cases of Davy, Herschel and Faraday', in Piers Bursill-Hall (ed.), *R.J. Boscovich Vita e attività scientifica His life and scientific work*, (Rome, 1993 [published 1994]), pp.577-85
- Frank A.J.L. James, 'Michael Faraday, The City Philosophical Society and the Society of Arts', *Royal Society of Arts Journal*, 1992, **140**: 192-199.
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- Frank A.J.L. James, 'The Military Context of Chemistry: The Case of Michael Faraday', *Bulletin for the History of Chemistry*, 1991, **11**: 36-40.
- Frank A.J.L. James, 'Michael Faraday's First law of Electrochemistry: How Context Develops New Knowledge' in John T. Stock and Mary Virginia Orna (eds.), *Electrochemistry, Past and Present*, (Washington, 1989), pp.32-49;
- Alice Jenkins, *Michael Faraday's Mental Exercises: An Artisan Essay Circle in Regency London*, (Liverpool, 2008).
- William B. Jensen, 'Michael Faraday and the Art and Science of Chemical Manipulation' *Bulletin for the History of Chemistry*, 1991, **11**: 65-76

Ole Knudsen, 'The Faraday effect and physical theory, 1845-1873', *Archive for History of the Exact Sciences*, 1976, **15**: 235-28.

James Clerk Maxwell, 'Scientific Worthies I. - Faraday', *Nature*, 1873, **8**: 397-9.

Allan A. Mills, 'The Early History of Insulated Copper Wire', *Annals of Science*, 2004, **61**: 453-467

Albert E. Moyer, *Joseph Henry: The Rise of an American Scientist*, (Washington, 1997).

Nancy J. Nersessian, *Faraday to Einstein: Constructing Meaning in Scientific Theories*, (Dordrecht, 1984).

Herbert T. Pratt, 'Michael Faraday's Bible as Mirrors of his Faith', *Bulletin for the History of Chemistry*, 1991, **11**: 40-7.

James Frederic Riley, *The Hammer and the Anvil: A Background to Michael Faraday*, (Clapham, 1954) which also covers the Sandemanians, but contains inaccuracies.

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Sydney Ross, 'The Search for Electromagnetic Induction', *Notes and Records of the Royal Society of London*, 1965, **20**: 184-219.

Sydney Ross, 'Faraday consults the scholars: The origins of the terms of electrochemistry', *Notes and Records of the Royal Society of London*, 1961, **16**: 187-220;

J. Brooks Spencer, 'On the Varieties of Nineteenth-Century Magneto-Optical Discovery', *ISIS*, 1970, **61**: 34-51

Oliver Stallybrass, 'How Faraday "Produced Living Animalculae": Andrew Crosse and the Story of a Myth', *Proceedings of the Royal Institution*, 1967, **41**: 597-619.

Friedrich Steinle, 'The Practice of Studying Practice: Analyzing Laboratory Records of Ampère and Faraday' in Frederic Lawrence Holmes, Jürgen Renn and Hans-Jörg Rheinberger (eds.), *Reworking the Bench: Research Notebooks in the History of Science*, (Dordrecht, 2003), pp.93-118, especially, 106-13

Friedrich Steinle, 'Looking for a 'simple case': Faraday and electromagnetic rotation', *History of Science*, 1995, **33**: 179-202.

Friedrich Steinle, 'Experiment, speculation and law: Faraday's analysis of Arago's wheel', *PSA: Proceedings of the Biennial Meeting of the Philosophy of Science Association*, 1994, **1**: 293-303.

Friedrich Steinle, 'Work, finish, publish?: the formation of the second series of Faraday's experimental researches in electricity', *Physis*, 1996, **33**: 141-220.

John T. Stock, 'The Pathway to the Laws of Electrolysis', *Bulletin for the History of Chemistry*, 1991, **11**: 86-92.

Pasquale Tucci, 'Faraday contro Nobili: un episodio della polemica antiampèriana', *Giornale di fisica della Società italiana di fisica*, 1984, **25**: 347-364.

Ryan Tweney, 'Faraday's Notebooks: The Active Organization of Creative Science', *Physics Education*, 1991, **26**:301-6.

Ryan Tweney, 'Fields of enterprise: On Michael Faraday's thought', in Doris B. Wallace and Howard E. Gruber (eds.), *Creative people at work: Twelve Cognitive Case Studies*, (New York, 1989) pp.91-106

Ryan Tweney, 'Inventing the field: Michael Faraday and the creative 'engineering' of electromagnetic field theory' in Robert J. Weber and David H. Perkins (eds.), *Inventive minds: Creativity in technology*, (New York, 1992), pp.31-47.

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Frans van Lunteren, *Framing Hypotheses: Conceptions of Gravity in the 18th and 19th centuries*, (Utrecht, 1991).

Roger Withington and B.R. James, *The New £20 Note & Michael Faraday*, (Loughton, 1991).

Michael Faraday was a British scientist who contributed significantly to technology used in everyday modern life. Michael Faraday's inventions include the electric motor, the transformer, the generator, the Faraday cage and several other devices. Faraday is considered the Father of Electromagnetism. TL;DR (Too Long; Didn't Read). Michael Faraday was a prolific chemist and physicist who worked in the 19th century in Great Britain. Faraday invented or developed many items and methods, including the electric motor, transformer, generator, Faraday cage and many other achievements. Why Is Michael Faraday the Father of Electricity? Because of his work, Michael Faraday is called the Father of Electricity. Many also consider him the Father of Electromagnetism. Michael Faraday achieved his early renown as a chemist. He made many important contributions to chemistry. In 1820, Faraday produced the first known compounds made from carbon and chlorine, hexachloroethane (C<sub>2</sub>Cl<sub>6</sub>) and tetrachloroethene (C<sub>2</sub>Cl<sub>4</sub>). Michael Faraday provided evidence for this fact by applying pressure to liquefy chlorine gas and ammonia gas for the first time. These were till then believed to be "permanent gases", or gases incapable of liquefaction. During ammonia liquefaction, Faraday also noted that when he allowed the ammonia to evaporate again, it caused cooling. Michael Faraday, the son of an 18th Century blacksmith, became one of the greatest scientists of his age. One of his discoveries transformed the world and changed the way we live forever. Michael Faraday's most important and lasting contribution to science - and all our lives - was the invention of the electric motor. Through his work with electrolysis, Faraday became fascinated by electricity and magnetism, which at the time were thought to be separate forces. Modern physicists now recognize a single electromagnetic force. Below, there are some further resources if you would like to find out more about him and his work. Please Answer the Poll! Find out more