

- * E. Cohn, *Faraday and Maxwell*, Deutsches Museum V. D. I. Verlag, Berlin, 1932.
- * W. Cramp, *Michael Faraday and Some of his Contemporaries*, Pitman, London, 1931.
- * J. A. Crowther, *The Life and Discoveries of Michael Faraday*, Society for Promoting Christian Knowledge, London, 1918.
- * J. H. Gladstone, *Michael Faraday*, Macmillan, London, 1872.
- * D. Gooding and F. A. J. L. James, eds., *Faraday Rediscovered: Essays on the Life and Work of Michael Faraday (1791-1867)*, Macmillan, Basingstoke, 1985.
- * S. A. Hadfield, *Faraday and his Metallurgical Researches, with Special Reference to their Bearing on the Development of Steel Alloys*, Chapman and Hall, London, 1931.
- * F. A. J. L. James, ed., *The Correspondence of Michael Faraday*, Vol. 1, Institution of Electrical Engineers, Stevenage, 1991.
- * W. Jarrold, *Michael Faraday: Man of Science*, Partridge, London, 1891.
- * A. E. Jeffreys, *Michael Faraday, A List of his Lectures and Published Writings*, Royal Institution of Great Britain, London, 1960.
- * W. A. Kahlbaum and F. V. Darbishire, eds., *The Letters of Faraday and Schönbein, 1866-1862*, Williams and Norgate, London, 1899.
- * J. Kendall, *Michael Faraday: Man of Simplicity*, Faber, London, 1955.
- * R. W. P. King, *Michael Faraday of the Royal Institution*, Royal Institution of Great Britain, London, 1973.
- * D. K. C. MacDonald, *Faraday, Mawell, and Kelvin*, Anchor Books, Garden City, NY, 1964.
- * T. Martin, ed., *Faraday's Diary*, 7 Volumes and Index, Bell, London, 1932-1934.
- * T. Martin, *Faraday*, Duckworth, London, 1934.
- * T. Martin, *Faraday's Discovery of Electro-magnetic Induction*, Arnold, London, 1949.
- * A. Naccari, *La vita di Michele Faraday*, Fratelli, Padova, 1908.
- * G. Porter and J. Friday, eds., *Advice to Lecturers. An Anthology Taken from the Writings of Michael Faraday and Lawrence Bragg*, The Royal Institution, London, 1974.
- * W. Ostwald, *Michael Faraday; eine psychographische Studie*, Roscher, Zürich, 1924.
- * W. L. Randall, *Michael Faraday, 1791-1867*, Parsons, London, 1924.
- * J. F. Riley, *The Hammer and the Anvil: A Background to Michael Faraday*, Dalesman, Clapham, 1954.
- * W. Schutz, *Michael Faraday*, Teubner, Leipzig, 1968.
- * H. Sootin, *Michael Faraday: From Errand Boy to Master Physicist*, Messner, New York, NY, 1960.
- * J. M. Thomas, *Michael Faraday and the Royal Institution, The Genius of Man and Place*, Adam Hilger, Bristol, 1991.
- * S. Thompson, *Michael Faraday. His Life and Work*, Macmillan, New York, NY, 1898.
- * R. D. Tweney and D. Gooding, eds., *Michael Faraday's "Chemical Notes, Hints, Suggestions and Objects of Pursuit" of 1822*, Peregrinus, London, 1991.
- * J. Tyndall, *Faraday as a Discoverer*, Longmans, Green, London, 1868.
- * L. P. Williams, *Michael Faraday. A Biography*, Basic Books, New York, NY, 1965.
- * L. P. Williams, R. FitzGerald and O. Stallybrass, eds., *The Selected Correspondence of Michael Faraday*, 2 Volumes., University of Cambridge, Cambridge, 1971.

A FARADAY TIMETABLE

Year	<i>Faraday's Life</i>	<i>Concurrent Political and Chemical Events</i>
1790		* Publication of the English translation of Lavoisier's <i>Traité élémentaire de chimie</i> .
1791	* Born on 22 September in Newington Butts near London.	* Formulation of the metric system.
1792		* Publication of first volume of Richter's <i>Anfangsgründe der Stöchiometrie</i> .
1794		* Execution of Lavoisier.
1799		* Royal Institution (RI) founded by Count Rumford; discovery of voltaic pile; death of Black.
1801		* Humphry Davy and Thomas Young receive appointments at the RI; Dalton formulates his law of partial pressures; discovery of vanadium, tantalum, and niobium.
1803		* Publication of Berthollet's <i>Essai de statique chimique</i> ; Berzelius and Hisinger study the electrolysis of salts; the Louisiana Purchase.

- 1804
- 1805 * Begins bookbinder's apprenticeship.
- 1806
- 1807
- 1808
- 1809
- 1810 * Gives first lecture to the City Philosophical Society.
- 1811
- 1812 * Attends Davy's lectures at RI; ends apprenticeship.
- 1813 * Joins RI, begins European tour with Davy and Lady Davy; assists Davy in investigation of newly discovered iodine.
- 1814 * Tours Italy, Switzerland, Bavaria and again France.
- 1815 * Returns to England; promoted to Assistant and Superintendent of the Laboratory at RI; assists Davy in invention of safety lamp.
- 1817 * First independent paper on "Native Caustic Lime".
- 1818 * Begins protracted work with Stodart on steel and its alloys.
- 1820 * Prepares C_2Cl_6 and C_2Cl_4 .
- 1821 * Marries Sarah Barnard; demonstrates electromagnetic rotation.
- 1822 * Oersted visits Faraday.
- 1823 * Liquefies chlorine and other gases.
- 1824 * Elected to the Royal Society.
- 1825 * Isolates and characterizes bicarburet of hydrogen (benzene), begins five-year study of optical glass.
- 1826 * Inaugurates Christmas Lectures "adapted to a juvenile audience"; gives first Evening Discourse on "Caoutchouc."
- 1827 * Publication of *Chemical Manipulation*
- 1828
- 1829 * Appointed to Professorship at Royal Military Academy.
- 1830
- 1831 * Publication of "Experimental Researches in Electricity [First Series]"; discovers electromagnetic induction.
- * Death of Priestley.
- * Grotthuss mechanism of electrolysis; Battle of Trafalgar.
- * First use of coal and oil gas for street illumination.
- * Davy isolates potassium and sodium.
- * Davy isolates calcium, barium, and strontium as metals, Berzelius as amalgams; Dalton publishes the atomic theory in his *New System of Chemistry*, Part I.
- * Gay-Lussac establishes law of combining volumes; Davy establishes elemental nature of chlorine; death of Fourcroy.
- * Death of Cavendish.
- * Avogadro states his hypotheses; discovery of iodine.
- * Berzelius introduces dualistic theory.
- * Death of Rumford in Paris; Berzelius' first table of atomic weights; British burn "White" House.
- * Battle of Waterloo; Fresnel introduces "transverse wave theory of light".
- * Discovery of lithium and cadmium; publication of 1st edition of Gmelin's *Handbuch*.
- * Dulong and Petit propose their law of atomic heats.
- * Oersted and Ampère demonstrate connection between electricity and magnetism.
- * Fourier publishes *Théorie analytique de la chaleur*; Berzelius begins his *Jahres-Bericht*; death of Berthollet.
- * Berzelius isolates silicon.
- * Carnot introduces his thermodynamic cycle; Liebig sets up teaching laboratory at Giessen.
- * Berzelius isolates titanium; Oersted isolates aluminum.
- * Discovery of bromine; Davy's final lecture "On the Relation of Electrical and Chemical Changes"; Dumas method for measuring vapor densities.
- * Ohm publishes his law.
- * Wöhler converts ammonium cyanate to urea; death of Wollaston.
- * Death of Davy in Geneva on 29 May; Döbereiner's first paper on chemical triads; discovery of thorium; Graham's law of diffusion; death of Vauquelin.
- * Publication of Lyell's *Principles of Geology*; Berzelius coins the term isomerism.
- * British Association for The Advancement of Science founded; north magnetic pole located.

- 1833 * Publication of "On the Identity of Electricity Derived from Different Sources".
- 1834 * Publication of law(s) of electrolysis; correspondence with William Whewell on electrochemical nomenclature; studies on electrochemical catalysis; appointed Fulleren Professor of Chemistry at RI.
- 1835 * Studies conduction of electricity by gases.
- 1836 * Dielectric constant, permittivity, Faraday cage experiment.
- 1837 * Lectures "On Induction"; introduces lines of force.
- 1838 * Begins to experience severe health problems and loss of memory.
- 1839 * Publication of first volume of *Experimental Researches in Electricity*.
- 1841 * Extended recuperation in Switzerland.
- 1842
- 1843
- 1844 * Publication of second volume of *Experimental Researches in Electricity*.
- 1845 * Publishes "On the Liquefaction and Solidification of ... gases"; studies the "Faraday Effect" and diamagnetism.
- 1846 * Publishes "Thoughts on Ray Vibrations."
- 1848 * Studies magnetic anisotropy.
- 1849
- 1850 * Fails to establish link between gravity and electricity.
- 1851 * Demonstrates paramagnetism of gaseous oxygen to RI audience.
- 1852
- 1853 * Publication of *Lectures on the Non-metallic Elements*.
- 1854 * Publishes "Observations on Mental Education".
- 1855 * Publication of third volume of *Experimental Researches in Electricity*.
- 1856
- 1857 * Writes last major paper on colloidal metal systems; this is also the subject of his last Bakerian Lecture.
- 1858 * Receives life-tenancy of house at Hampton Court Palace.
- 1859 * Publication of *Experimental Researches in Chemistry and Physics*.
- * Babbage develops difference engine; Gauss proposes absolute electrical and magnetic units.
- * McCormick patents his reaper; British Association recommends adoption of Berzelius' chemical symbolism, Dumas formulates his law of substitution.
- * Republic of Texas established; invention of the Daniell cell.
- * Deere introduces steel plow; beginnings of the electric telegraph; Victorian era begins.
- * Daguerre describes his photographic process; discovery of lanthanum.
- * First meeting of The Chemical Society (of London); Fox Talbot introduces photographic negative/positive process.
- * Grove describes first fuel cell; Mayer states first law of thermodynamics; invention of the Bunsen cell.
- * Joule reports on conservation of energy and mechanical equivalent of heat.
- * Death of Dalton; discovery of ruthenium.
- * Founding of the Royal College of Chemistry; Schönbein discovers gun cotton.
- * Publication of the *Communist Manifesto* and Mill's *Principles of Political Economy*; death of Berzelius; Pasteur discovers molecular asymmetry.
- * Death of Gay-Lussac; Wilhelmy's study of the rate of the hydrolysis of sugar; Graham distinguishes colloids and crystalloids.
- * Kelvin reconciles the work of Carnot and Joule.
- * Frankland anticipates the concept of chemical valence.
- * Tyndall appointed Professor of Natural Philosophy at RI; death of Laurent.
- * Clausius introduces the entropy function but not the term.
- * Invention of the dichromate cell.
- * Perkin synthesizes mauve; death of Gerhardt.
- * Death of Thénard.
- * Couper and Kekulé propose quadrivalence and catenation of carbon; Cannizzaro rationalizes atomic weights in his *Sunto*.
- * Publication of Darwin's *On the Origin of Species*; Bunsen and Kirchhoff study spectra.

- 1860 * Publication of *Various Forces of Nature*.
- 1861 * Publication of *The Chemical History of a Candle*; offers his resignation to the Managers of the RI.
- 1862 * Performs last experiment seeking effect of magnetic field on flame spectra; last Friday Evening Discourse; moves permanently to Hampton Court.
- 1864 * Publication of Meyer's *Die modern Theoriern der Chemie*; Guldberg and Waage formulate the law of mass action.
- 1865 * Publication of Hofmann's *Modern Chemistry*; Newlands publishes his law of octaves; Clausius proposes the term entropy; Kekulé proposes his benzene structure.
- 1867 * Death on 25 August.
- * Karlsruhe Conference; discovery of cesium.
- * The Emancipation Edict frees Russian serfs; start of American Civil War; discovery of rubidium and thallium; Solvay Process.
- * August W. Hofmann lectures at RI on "Mauve and Magenta."
- * Marx publishes first volume of *Das Kapital*.

University of Cincinnati
 BULLETIN FOR THE HISTORY OF CHEMISTRY
 William B. Jensen, Editor
 Department of Chemistry
 University of Cincinnati, M. L. 172
 Cincinnati, OH 45221

Non-Profit Org.
 U. S. Postage
PAID
 Cincinnati, OH
 Permit No. 133

0935308Y 06/92 ZI 515 1
 EVAN M. MELHADO
 UNIV OF ILL-SCH OF CHEM SCI
 505 S MATHEWS-BOX 3 NOYES LAB
 URBANA IL 61801-3617