

## Michael Faraday, a Christian Dynamo

By Stephen McDowell

**M**ichael Faraday is among the three or four greatest experimental scientists of all time.

He laid the foundation for the beginning of new fields of science including electromagnetism, magneto-optics, and diamagnetism. He transformed how people live by inventing the dynamo and electric motor, which became the foundation for the modern day electrical industry.

Faraday's Christian faith enabled him to accomplish his great scientific endeavors. His Christian worldview gave him the proper framework to pursue new discoveries and his Christian character enabled him to labor in his laboratory long hours, day and night, for years.

From the time of his birth in 1791 until his death in 1867, Michael was a part of a small Christian group known as Sandemanians. He officially joined them after he married. Named after their founder Robert Sandeman (who died in 1771), the Sandemanians were one of many dissenting groups that formed to counter what was believed to be a lack of living faith in the Church of England. This movement started around the same time as the work of George Whitefield and John Wesley. They believed in the Bible as God's Word and other fundamentals of the faith. Faraday said of his Christian association: "I am of a very small and despised sect of Christians known, if known at all, as Sandemanians, and our hope is founded on the faith that is in Christ."<sup>1</sup>

After receiving a simple education as a boy, Michael was apprenticed to a bookbinder in 1804. He would become an excellent binder of books over the years, but more

importantly he was introduced to the world of books, knowledge, and science through access to books in the shop. This enabled Michael to accomplish his great life work.

While an apprentice he continued to attend the Sandemanian meeting-house. Here he had access to truth through the book of Scripture. He would also gain access to the truth through the "book of nature." Faraday believed God wrote both of these — "the book of nature" was "written



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by the finger of God."<sup>2</sup> The introduction to truth in all areas of life and learning came in 1809 from a newly reprinted book written by Isaac Watts called *The Improvement of the Mind*. Watts recommended much reading on many subjects, joining with others for mental improvement, taking classes, and keeping a "commonplace" book to record ideas and observations. Faraday followed this advice, starting his own commonplace book he entitled *The Philosophical Miscellany*. To further his communication skills he engaged a coach to help him improve his writ-

ing. He also began to attend lectures of various scientific topics, taking meticulous notes.

One of these lecture series was conducted by the great scientist, Sir Humphrey Davy. Faraday took copious notes that he bound together and presented to Davy. The skill, precision, and scope of notes and observations attracted Davy's attention. Later, when Davy's laboratory assistant quarreled with him and was dismissed, Faraday was hired in his place. This providential incident was an important step in Faraday's life work.

Though not a regular member yet, Faraday continued attending the Sandemanian chapel in London, regularly listening to the Scriptures, singing hymns, and absorbing Christian values. He fell in love with and married a member of this congregation, Sarah Barnard. Their entire married life could be summarized by his early words: "We are happy, and our God has blessed us with a thousand causes why we should be so."<sup>3</sup> Soon after marriage he joined the Sandemanian church. This was the natural process of his growing faith. He expressed "a readiness to do whatever Christ has commanded"<sup>4</sup> as he was welcomed into the small group of believers. One of his friends said his weekly attendance at church gave him the strength and life necessary for the immense energy he exerted over the years in his scientific pursuits.

Faraday's Biblical worldview communicated to him a universe that operated according to a set of laws which demonstrated both economy and elegance. This provided the framework for his scientific research and discoveries. He spoke of the "gifts of God" given for man's benefit and

of nature operating “for our good;” he saw scientific laws originating from the Creator as beneficial to man when he discovered and applied them.<sup>5</sup>

While working under Davy, and later under William Brande, at the Royal Institution, Faraday developed his practical research skills, and as an assistant editor for the *Journal of Science and the Arts*, he read many research papers by chemists from many nations. In addition, he studied in detail many journals and books. All of this added greatly to his scientific knowledge and abilities, and was a vital part of his preparation process.

When Faraday began lecturing on his own, he used clearly understood experiments and relentless logic to communicate truth to his audience, allowing them to come to their own conclusions, instead of his telling them what they ought to conclude. He learned through his church the importance of self-discovery of truth. As Bible truths were presented, each individual came to his own conclusions. This enabled each person to take possession of the truth for himself, thus making it his own property.

A key element of Faraday’s lectures was the use of demonstrations. This was not often done by other scientists at this time, but Faraday thought this was the best way to teach the concepts of science. It made clear to the audience the point he wanted to teach.

Faraday would faithfully attend church each Sunday. The Sandemanian meetings lasted almost all day. On Wednesday evenings Michael would often visit other church members. When he became a deacon in 1832 and an elder in 1840, this became more of a duty. He also began to be involved in preaching at Sandemanian meetings in London, as well as other towns throughout the country.

Faraday did much work in the field of chemistry, but his greatest accomplishments were in the new field of electromagnetism. In 1831 he did various experiments showing that electricity produces a magnetic effect and that magnetism produces electricity. He documented the first case of electromagnetic induction and demonstrated that a moving magnetic field produces a flow of electric current, writing that he had obtained “production of a permanent current of electricity by ordinary magnets.”<sup>6</sup> With the construction of a moving disk in a magnetic field that produced a continuous electric current, he had invented the dynamo. This was the foundation for the modern day electrical industry.

Faraday could not see at this time the immense effects his discovery would have for mankind, but he did understand the nature of socialistic man. When the British Prime Minister Sir Robert Peel visited the Royal Institution and asked Faraday what was the use of his new electrical discovery, Faraday replied: “I know not, but I wager one day your government will tax it.”<sup>7</sup>

When some papers suggested others had made this discovery just before Faraday, he took pains to prove his rights of priority and ownership, because the principle of property was important to him. One gentleman wrote, “Underneath his sweetness and gentleness was the heat of a volcano.”<sup>8</sup> Being self-governed he nearly always kept this “heat” under control.

His efforts to show his right of ownership were not motivated by financial gain, for he gave away his discovery to mankind in general, and the immense wealth that would come with it. Throughout most of his career he was underpaid, but he was willing to sacrifice because he believed he was

involved in God’s work for the benefit of mankind. Faraday never patented his inventions, even though he could have earned possibly 5000 pounds per year from them (over one-half million dollars in today’s money). He was more concerned with Godly wealth than material riches.<sup>9</sup>

While Faraday’s published scientific papers do not contain many references to God, other of his writings do. One document discovered in the late 1960s has many references. This private memorandum by Faraday expressing his ideas on atoms and fields posited his view that God could put “power” round point centers similar to fields around material nuclei (something like magnetic fields around poles). One writer said that from thereafter, “Faraday was, quite literally, at play in the fields of the Lord.”<sup>10</sup>

Failing health forced Faraday to put aside his strenuous work for many years. By 1845 he had recovered and began to devote himself to possibly his supreme scientific achievement. Through various experiments he came to show that magnetism and light were related. He laid the groundwork for a whole new field of science: magneto-optics. His writings on this subject were published in April 1846 in the *Philosophical Magazine* in an article entitled, “Thoughts on Ray Vibrations.” One scientist considered the paper “one of the most singular speculations that ever emanated from a scientific man.”<sup>11</sup> Faraday was showing that light is a form of electromagnetic radiation. His idea greatly influenced James Clerk Maxwell who expounded upon this idea in 1864. Other findings by Faraday laid the foundation for magneto-chemistry.

As his fame increased, Faraday was offered many awards and honors. His humble faith was seen when he