

Georg Ohm's pioneering treatise presents the fundamental law of electrical circuitry for the first time.

Ohm, Georg Simon, *Die galvanische Kette, mathematisch bearbeitet*. Berlin, T.H. Riemann, 1827. 8 ¼ inches (210 mm). iv, 245, [1] pp.

The familiar units of electrical measurement—watt, volt, ampere, joule, hertz, coulomb or ohm—are signposts or mementos of the historical development of the science. This pattern of naming was established at the International Electrical Conference at Paris in 1881, when the “ohm” was first defined. It is tempting to detect in it the influence of the then-fashionable secular calendar of Auguste Comte, whose religion of Positivism attracted many scientists and whose “Calendar of Great Men” was a secular version of the Roman Catholic church calendar. An ohm is the basic unit of resistance, commemorating Georg Simon Ohm (1789–1854) and the contents of his pioneering treatise, here reproduced.

Die galvanische Kette mathematisch bearbeitet (1827), or “The Galvanic chain mathematically investigated” presents fully and for the first time the fundamental law of electrical circuitry—what has come to be known as “Ohm’s Law,” that is, that in measuring the rate of flow in (and resistance to) an electrical current, resistance is a constant, independent of the amount of voltage or the current. Ohm proceeded to his conclusions by analogy with Fourier’s thermodynamic equations relating to the flow or dissipation of heat along a conductor, as enunciated in the *Théorie analytique de la chaleur* (1822).

Ohm’s Law, that Current equals Electromagnetic Force divided by Resistance, may be presented (and is invoked today) in various equivalent equations (e.g., that electromagnetic force is the product of current times resistance), depending on the branch of science by which it is employed. Ohm’s original formulation, however, may be seen on page 36 (**Spread 24**), where S is the *elektrischer Strom* or current (the quantity of electricity passing through a given cross-section of the conductor in unit time), A is defined as the sum of the tensions of all sources of electromotive force, and L is the total reduced length (*reducirte Länge*) of the entire circuit. In quoting the Law today, Ohm’s

original German initials are usually replaced with their anglicized equivalents. S is expressed as I (for electrical Intensity); A has become E (for Electromotive force), and L is now R (for Resistance).

This copy was formerly owned by the English electrical engineer Conrad William Cooke (1843–1926), author of *Automata old and new* (London, 1893). His signature appears on the front flyleaf (**Spread 2**), dated 17th December, 1889.