RICHARD DEDEKIND
(1833-1916)*

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On February 12, 1916, Julius Wilhelm Dedekind died at his native Brunswick in Germany. He was one of the world's most distinguished workers at the theory of numbers, and in particular with Ernst Eduard Kummer and Leopold Kronecker at the theory of algebraic numbers; and most of his work is described in supplements to his editions of Dirichlet's *Vorlesungen über Zahlentheorie*.[1] In these supplements we can find references to his fundamental and enormously important ideas on the nature and meaning of numbers.

From the point of view of the fundamental principles of mathematics and the closely allied questions of logic and philosophy, the most important works of Dedekind are on the explanation of "continuity" by comparison with the system of real numbers, in which the irrational numbers were defined in a memorable way, and on the exceedingly subtle question of the definition, by logical concepts alone, of the integer numbers. Both of Dedekind's classical pamphlets: *Stetigkeit und irrationale Zahlen* of 1872 and *Was sind, und was sollen die Zahlen?* of 1888 have been translated into English by W.W. Beman under the title: *Essays on the Theory of Numbers: I. Continuity and Irrational Numbers; II. The Nature and Meaning of Numbers*.[2] It is to this translation that the notes below refer.

The ideas of Dedekind on the nature and meaning of numbers, which are here described (§ II) after his logically subsequent and historically earlier work on continuity (§I), led Dedekind to work out—apparently in complete independence of the previous work of De Morgan and the contemporary work of Charles Peirce—the greater part of what is now known as "the logic of relations." On another occasion I hope to give an account of later critical and constructive work on both these contributions of Dedekind to the principles of mathematics.

I.

In the autumn of 1858, Dedekind, who was then professor at the Polytechnic School of Zurich, had, for the first time in his life, to lecture on the elements of the differential calculus, and then felt more acutely than ever before the lack of a really scientific

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*The correct year of Dedekind's birth is 1831, not 1833 (editor).

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[1]A short indication of Dedekind's mathematical works was given by G.B. Mathews in *Nature*, vol. XCVII, 1916, pp. 103-104.

[2]Chicago and London: The Open Court Publishing Co., 1901.