

1067-01-26

**Maritza M. Branker\*** (mbranker@niagara.edu), Department of Mathematics, Niagara University, Lewiston, NY 14109, and **Joseph J. Little**. *Neither Positive nor Negative nor yet Null numbers: Analogy in William Rowan Hamilton's Argument for imaginary numbers.*

Studies of analogy in technical discourse have made important strides in the thirty years since George Lakoff and Mark Johnson ushered in the cognitive linguistic turn. Scientific analogy has been discussed, illuminating both interpersonal and intrapersonal faces of its epistemic functioning but no one has considered how analogy functions in research level mathematics.

We analyze the role of analogy in William Rowan Hamilton's 1837 work, "Theory of conjugate functions, or algebraic couples; with a preliminary and elementary essay on algebra as the science of pure time". Hamilton's theory was developed in order to place the concept of complex numbers on a secure algebraic footing, after less than successful attempts by others to legitimize them by introducing geometrical interpretations. Hamilton's elegant solution was to reinterpret the existing real number system in a purely algebraic manner to allow a natural and rigorous extension which would encompass, but not be limited to complex numbers.

We make the argument that in this seminal work analogy served substantively in the rigorous work of mathematical activity itself, positioned not alongside mathematics but underlying it. (Received May 31, 2010)