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James R Henderson* (jrh66@psu.edu), 402 W Main Street, Titusville, PA 16354. *Explanatory Proofs.*

When investigating the character of mathematical explanation, it is not unreasonable to begin with the literature concerning scientific explanation. If this approach is taken, the discussion must begin with Hempel and Oppenheim's 1948 paper, "Studies in the Logic of Explanation." Here a template for explanation is laid out, and a body of writing, some critical and some supportive, develops. The pump thus primed, new formulations of "scientific explanation" were produced in the ensuing years. Not surprisingly, some explanatory schemes designed for a scientific setting are a better fit for a mathematical context than others. I will stick to definitions of 'proposition', 'argument', and 'proof' used in this literature to assure a sound analysis. Study of equivalent theorems (for instance, the Mean Value Theorem and Rolle's Theorem) will offer interesting insights into this undertaking. It may also be useful to try to address the question of whether it is coherent to describe an explanation as successful and, if so, whether the success of an explanation is subject to degree. (Received September 05, 2019)