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Donald A. Sokol*, 11S047 Palisades Rd., Burr Ridge, IL 60527. *Euclid, Integer Triples and the Babylonian Connection: The triangular number based spreadsheet.*

Analyses and discussion of the Babylonian table entitled Plimpton 322 suggest the Babylonians were acquainted with the algorithm, as stated in Euclid's Elements, that is used to calculate the a, b, and c of the relationship $a^2 + b^2 = c^2$. It is more likely that it was the other way around. Euclid produced the famous $a = 2xy$, $b = x^2 - y^2$, and $c = x^2 + y^2$ by attaching "-y" to the "x" in the Babylonian equation for "a". The Babylonians appear to have used this equation to create a triangular number based spreadsheet in positive integers of a, c, and b.

In so doing Euclid rotated the mapping of the Babylonian spreadsheet 45 degrees, a change that enabled him to introduce two caveats: 1) That x be greater than y and both positive, and 2) if x and y are opposite parity and relatively prime, a primitive integer triple is produced.

Driven by the need for simplicity or to avoid confusion or otherwise, this modification allowed Euclid to hide from view for over 2300 years two significant characteristics of what is now called the Pythagorean Theorem: 1) That every integer triple is founded on a triangular number, and 2) that more than one x, y combination can satisfy the same integer triple in a, b, and c and one cannot easily be certain which algorithm was used. (Received July 12, 2014)