[Review of Helen Elizabeth Ross & Betty Irene Knott, “Dicuil (9th century) on triangular and square numbers”]

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Helen Elizabeth Ross & Betty Irene Knott

Dicuil (9th century) on triangular and square numbers

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In 814, at the crowning ceremony which made Louis the Pious successor to Charlemagne, the Irish monk Dicuil offered book I of a treatise on computus (four more books were to follow during the years 814–816). Its chapter 6 deals with triangular and square numbers. The article contains the Latin text of this chapter, first published by Mario Esposito in 1907, together with and English translation. This is preceded by a short presentation of preceding evaluations of Dicuil's work computus; the general background concerning triangular and square numbers; a mathematical commentary and contextual history to the chapter itself; and a short conclusion about the afterlife of the formulas for the computation of a triangular number, which Dicuil prefers to call "increasing" (*crescens*).

Dicuil gives two formulas, one for the n'th triangular number $T(n)$ and one for the corresponding square number $Q(n)$,

$$T(n) = (n\cdot[n+1])/2, \qquad Q(n) = 2T(n)–n$$

formulated in words but in general terms. He also hints at the reverse

$$T(n) = [Q(n)+n]/2$$

Looking at likely sources, the authors plausibly suggest that Dicuil

derived them himself from Boethius's *Arithmetic*.

In the discussion of the afterlife of the formulas, the authors claim that they only reappear with Maurolico and Harriot. This is a mistake. For instance, the former is found in Sacrobosco's immensely influential *Algorismus vulgaris*, merely with the division performed first, and therefore worded differently according to whether n is odd or even.