Hurling's Mathematical Story

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Abstract. GAA people know about matrices.

South of Thurles, Hurling followers know all about Ring Theory [2], and know they know about it, but they also know a little about Matrix Theory, and possibly do not know they know about it. A goal is worth 3 points,

$$\text{goal} = 3\ \text{point} \tag{1}$$

and hence a score line of say $(2, 5)$ is an example of a *row matrix*:

$$\begin{pmatrix} 2 & 5 \end{pmatrix} \begin{pmatrix} \text{goal} \\ \text{point} \end{pmatrix} = 2\ \text{goal}+5\ \text{point} = \big((2)(3)+(5)(1)\big)\text{point} = 11\ \text{point}. \tag{2}$$

There is more matrix multiplication latent in this:

$$\begin{pmatrix} \text{goal} \\ \text{point} \end{pmatrix} = \begin{pmatrix} 3 \\ 1 \end{pmatrix} \text{point} \tag{3}$$

and

$$\begin{pmatrix} 2 & 5 \end{pmatrix} \begin{pmatrix} 3 \\ 1 \end{pmatrix} = (2)(3) + (5)(1) = 11. \tag{4}$$

In fact equation (1) has not always been true: back in 1894 ([1], Chapter II) a goal was worth "any number of" points. The matrix theory pattern however would survive a finite change in the relationship between goals and points.

Potentially Hurling followers might also learn about Infinitesimals. There is at present no concept of "tie breaker", or "penalty shoot out", in Gaelic games; in soccer however there is an advantage, in two-leg encounters, awarded to "away goals". In a similar way one could imagine, in drawn encounters, offering an added advantage to goals over points. For example the score lines (1,8), (2,5) and

(3,2) all currently contribute the same number, 11, points, and the suggestion would be that

$$(3,1) < (1,8) < (2,5) < (3,2) < (2,6) : \tag{5}$$

the goal advantage would only kick in when the number of points was equal. Since this pattern is to persist for unimaginably large score lines, this is achieved by replacing (1) by

$$\text{goal} = (3+\varepsilon)\text{point}, \tag{6}$$

where ε is an "infinitesimal" [3]. Similarly, back in 1894 a point was an infinitesimal goal:

$$\text{point} = \varepsilon \text{ goal}. \tag{7}$$

REFERENCES

[1] Tim Horgan, Cork's Hurling Story, Anvil Books 1977.
[2] Tim Horgan, Christy Ring: Hurling's Greatest, Collins Press 2007.
[3] http://www.britannica.com/EBchecked/topic/287641/infinitesimal.

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