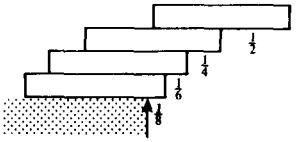
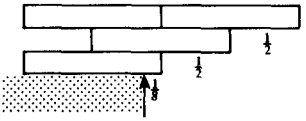
Finely balanced

DEAR EDITOR,

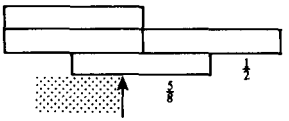
I wonder whether your readers would be interested to know that, if asked to pile up 4 uniform bricks of unit length so as to achieve the longest possible 'projection' P of a brick-tip from the point of balance of the whole pile, you can do better than



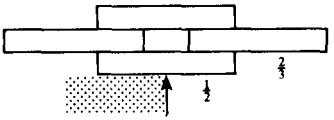
which gives $P = 1\frac{1}{24}$, not only with



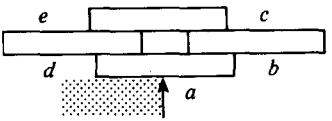
or



giving $P = 1\frac{1}{8}$, and even better with



giving $P = 1\frac{1}{8} \approx 1{\cdot}166\,667$, but (to me quite astonishingly) with



where

$$a = \frac{7-2\sqrt{2}}{8}, \quad b = \frac{4-\sqrt{2}}{4}, \quad c = \frac{19-10\sqrt{2}}{7}, \quad d = \frac{11-\sqrt{2}}{14}, \quad e = \frac{31\sqrt{2}-26}{28}.$$

giving

$$P = a + b = \frac{15-4\sqrt{2}}{8} \approx 1{\cdot}167\,893.$$

That this last pattern does balance, and that the measurements given do maximise the projection for an arrangement of this shape, have been confirmed by both Bondis, to whom I am extremely grateful.

Yours sincerely,

STEPHEN AINLEY

8 Poynder Place, Hilmarton, near Calne, Wilts. SN11 8SQ

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