contrasting activities in home and garden—an 'engineer at heart' as his wife Muriel described him.

All these qualities and accomplishments not only enriched his contribution as a schoolmaster, but also ensured that he would be held in high respect by both colleagues and pupils.

A brief account of his professional life should include the following. He came to Kings College London as a King's Scholar in 1938, and was awarded First Class in a Mathematics degree which included a component of Physics. The award of a distinction in his Teacher's Diploma in 1942 was an accurate prognostic of his future success. His teaching experience was in three successive schools. In the most recent of these, Vyners School, Ickenham, he was appointed Head of Mathematics from the time the school was established in 1959 until his retirement in 1982. During that time, he saw the school grow from humble beginnings to its full development as a five-form entry comprehensive school, and taught at all levels, besides organising the mathematical teaching, and succeeding in maintaining high academic standards among the able while introducing new courses for those of less ability.

Donald has been a valued member of the Mathematical Association as well as of the London Branch, for nearly 30 years. He has for many years been one of the assistant treasurers of the Association. A regular attender at the annual Conference over many years, usually accompanied by his wife, he leaves a large gap in the Association. His two children Susan and David, both now in their thirties have both inherited his mathematical gifts, and have been seen on many occasions at Conferences. To all the members of Donald's family, the Association offers its sincere sympathy.

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Correspondence

The quadratrix and Buffon's needle

DEAR EDITOR,

Finding connections between apparently unrelated topics in mathematics is one of the many fascinations of the subject. It can also lead to frustration when one is unable to identify, clearly and rigorously, an isomorphism that one intuitively suspects. Some time ago, while teaching a course on the history of mathematics, I came across just such a puzzling connection.

The quadratrix was a curve designed to solve the Ancient Greek problems of Trisecting the Angle and Squaring the Circle. It can be described in the following way. Imagine the line segment AB moving uniformly down the square until it coincides with the base OC. At the same time imagine the line segment OA rotating uniformly through 90° about O until it also coincides with OC. If these two motions occur at the same rate (i.e. they both finish at the same time) then the quadratrix is defined as the locus of their points of intersection. This is

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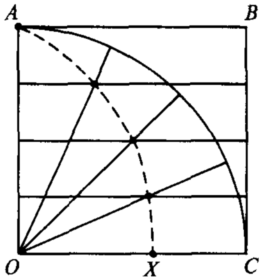

the dotted line shown in the diagram and some particular intersection points are illustrated. If the edge of the square is 1 unit in length then it can easily be shown, using limits, that the length of OX is $2/\pi$.

'Buffon's Needle' is the name given to a famous experiment which can give a probabilistic estimation for the value of π. A 'needle' (assumed uniform) is randomly dropped onto a set of parallel lines. If the distance between the lines is equal to the length of the needle then it can be shown, using integral calculus, that the probability that the needle crosses a line is $2/\pi$.

The intuitive similarity between these two situations would suggest that the identical result is hardly a coincidence. However, the similarity is hard to define precisely. There is a 'feeling' that the quadratrix is in some sense a dynamic representation of the needle experiment; but how exactly? The situation appears to suggest that I can obtain the Buffon result by 'mapping' to the quadratrix (which is an easier problem to solve) and finding the length of OX. But it is not clear (at least to me) why the length of OX can *represent the probability* of the needle crossing the parallel lines. Can any reader help to clarify?

Yours sincerely,

FRANCIS LOPEZ-REAL

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Space filling with identical symmetrical solids: a footnote to 69.14

DEAR EDITOR,