Commemorative Windows in the Hall of Gonville and Caius College, Cambridge, England

A. W. F. Edwards

Does your hometown have any mathematical tourist attractions such as statues, plaques, graves, the café where the famous conjecture was made, the desk where the famous initials are scratched, birthplaces, houses, or memorials? Have you encountered a mathematical sight on your travels? If so, we invite you to submit to this column a picture, a description of its mathematical significance, and either a map or directions so that others may follow in your tracks.

Please send all submissions to Mathematical Tourist Editor,
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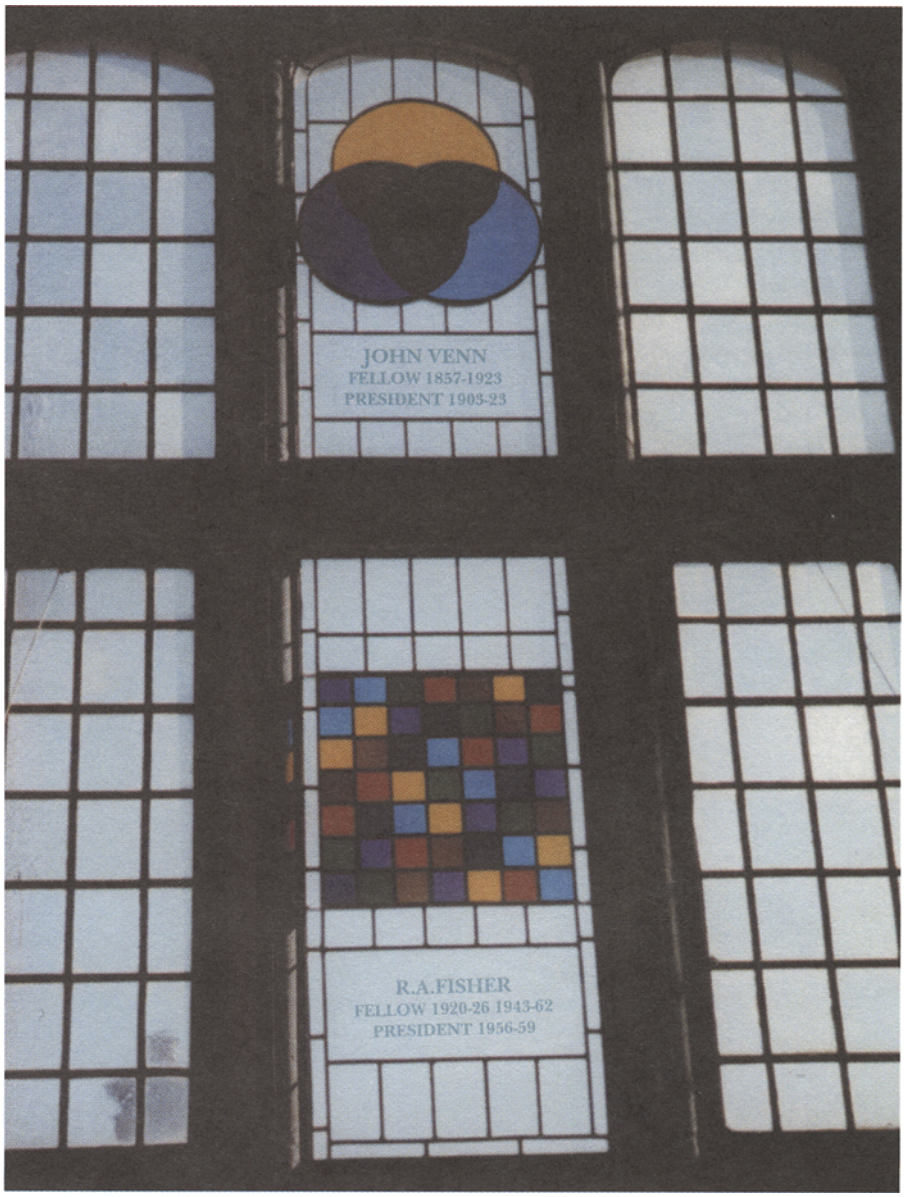
Dedicated to JOHN VENN
Fellow 1857–1923
President 1903–23
and
R. A. FISHER
Fellow 1920–26 1943–62
President 1956–59

The two windows, designed by Maria McClafferty following my proposals, were installed in August 1989.

The upper window shows a Venn Diagram for three sets, first used in set theory by John Venn in 1880 and made popular by its inclusion in his book *Symbolic Logic* the following year. Each circle represents a set; each pair of circles overlaps, and hence the three ways in which three sets can intersect in pairs are represented; and finally all three circles overlap in the centre, representing the single way in which three sets can triply intersect.



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The colours of the intersecting sets have been accurately portrayed by using the technique of plating, the glass being actually two and three layers thick where the sets overlap. The three basic colours are identical to three of the colours in the lower, Fisher, window, and the colours of the three pairwise overlaps will be seen also to match colours in the lower window. Only the red of the lower window is missing from the upper one. The central colour, formed by triple plating, is of course practically black.

The lower window, commemorating R. A. Fisher, depicts a 7×7 Latin square. It was erected as a contribution to the celebration of the centenary of his birth (17 February 1890), and the actual design is taken from the dust jacket of his famous book *The Design of Experiments*, published in 1935.

The best way to visualize the use of such a design is to imagine the problem of testing seven different strains of wheat for yield, given a square field for the experiment. Each colour corresponds to a strain of wheat, and it will be seen that each occurs just once in each row and once in each column, but that in other respects the distribution of the colours is arbitrary. If there should be a change in the fertility of the soil across the field, such a Latin-square pattern ensures that it will not benefit any particular strain of wheat, whilst at the same time the pattern provides a degree of arbitrariness which, according to Fisher's theory of the design of experiments, enables a statistical analysis of the yield differences to be undertaken.

Such designs have had a great influence on experimentation throughout science, and not just in agriculture.

Latin squares are so called because when they were first studied by the great Swiss mathematician Leonhard Euler he labelled the squares with Roman, as opposed to Greek, capitals, to distinguish the "colours." It is not known why Fisher chose this particular square for the dust jacket.

Maria Ulatowska McClafferty, the artist, was born and educated in Warsaw. She studied at Warsaw University and in the studios of Stanisław Szczepański and Adam Niemczyc. She emigrated to the U.K. via Rajasthan. Major exhibitions of her work as a painter-printmaker have been held in India, Poland, Sweden, Australia, and Canada, as well as the U.K. In 1981 she turned to decorative glass as a medium. Major works are installed in palaces in Abu Dhabi, Al Ain, and Dubai, and at home the Great Rose Window of Alexandra Palace is her work.

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