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**Paul W.T. Fijn\*** ([paul@ms.unimelb.edu.au](mailto:paul@ms.unimelb.edu.au)), 2/653 Park Street, Brunswick, Victoria 3056.

*Playing with Paths: An Introduction to Bijective Combinatorics.*

We introduce the field of Enumerative Combinatorics as applied to sets of paths on the square lattice. Key techniques and methods will be discussed, and their applications to several problems in the enumeration of lattice paths. In particular, pictorial bijections for some novel results will be used to illustrate the central ideas of enumerative combinatorics. Finally, we discuss the applicability of this work to areas as diverse as genetics, computer science and theoretical physics. (Received September 22, 2009)