1062-05-29 **Dan Archdeacon***, Department of Mathematics and Statistics, University of Vermont, Burlington, VT 05405, and **Marston Conder** (m.conder@auckland.ac.nz) and **Jozef Siran** (j.siran@open.ac.uk). *Trinity Symmetry and Kaleidoscopic Regular Maps.*

We consider maps consisting of a graph G embedded on a surface S. The map is *regular* if its automorphism group is of order $2|E(G)|$, that is, if it acts transitively on the directed edges and hence has of the largest order possible for any group of orientation-preserving automorphisms. The map is *reflexive* if it also allows orientation-reversing automorphisms, so that its full automorphism group is of order $4|E(G)|$. The *left-right walks*, or Petrie polygons, form the faces of another map G^P on G. A map has *trinity symmetry* if it is isomorphic to its geometric dual and its Petrie dual G^P. An *exponent of a map* is an e such that replacing the rotation ρ at any vertex by the rotation ρ^e yields a map isomorphic to the original. The map is *kaleidoscopic* if every e coprime to its common degree d is an exponent.

Can a map be regular, reflexive, have trinity symmetry, and be kaleidoscopic? Such maps are beautiful to contemplate, difficult to imagine, questioned as to their existence, but after a great deal of thought have a nice construction from a trivial base graph.

In this talk we present these maps. (Received June 24, 2010)