1105-17-236 **Tevian Dray*** (tevian@math.oregonstate.edu), Dept of Mathematics, Oregon State University, Corvallis, OR, **John Huerta** (jhuerta@math.ist.utl.pt), CAMGSD, Instituto Superior Técnico, Lisboa, Portugal, **Joshua Kincaid** (kincajos@math.oregonstate.edu), Dept of Physics, Oregon State University, **Corinne A. Manogue** (corinne@physics.oregonstate.edu), Dept of Physics, Oregon State University, **Aaron Wangberg** (awangberg@winona.edu), Winona State University, Winona, MN , and **Robert A. Wilson** (r.a.wilson@qmul.ac.uk), School of Mathematical Sciences, Queen Mary, University of London, London, United Kingdom. *Magic squares of Lie groups.*

The Tits-Freudenthal magic square yields a description of certain real forms of the exceptional Lie algebras in terms of a pair of division algebras. At the group level, the first two rows are well understood geometrically, with the minimal representations of F_4 and E_6 expressed in terms of the Albert algebra. In the third row, the minimal representation of E_7 consists of "Freudenthal triples", essentially a pair of Albert algebra elements.

We summarize here several recent results at the group level. First, we describe how to use Cartan decompositions involving all 5 real forms of E_6 to identify chains of real subgroups of the particular real form $SL(3, \mathbb{O})$. Second, we give a new description of Freudenthal triples in terms of "cubies", the components of an antisymmetric rank-3 representation of (generalized) symplectic groups, thus providing a unified, geometric interpretation of Freudenthal triples as a single object, a new description of the minimal representation of E_7, and an interpretation of the group $Sp(6, \mathbb{O})$. Along the way, we also discuss the closely related "2×2" magic square of orthogonal groups. (Received September 21, 2014)