1078-05-83 **Matthias Beck*** (`mattbeck@sfsu.edu`), Dept. of Math., 1600 Holloway Ave, SF State, San Francisco, CA 94132, and **Benjamin Braun** (`benjamin.braun@uky.edu`), Department of Mathematics, University of Kentucky, Lexington, KY 40506. *Euler–Mahonian statistics via polyhedral geometry.*

A variety of descent and major-index statistics have been defined for symmetric groups, hyperoctahedral groups, and their generalizations. Typically associated to a pair of such statistics is an *Euler–Mahonian distribution*, a bivariate generating function identity encoding these statistics. We use techniques from polyhedral geometry to establish new multivariate generalizations for many of the known Euler–Mahonian distributions. The original bivariate distributions are then straightforward specializations of these multivariate identities. A consequence of these new techniques is bijective proofs of the equivalence of the bivariate distributions for various pairs of statistics. (Received November 22, 2011)