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**Margaret M Bayer\*** (bayer@math.ku.edu), Department of Mathematics, 405 Snow Hall, University of Kansas, 1460 Jayhawk Boulevard, Lawrence, KS 66045-7523, and **Tibor Bisztriczky**, University of Calgary. *Gale and braxial polytopes.*

Cyclic polytopes are characterized as simplicial polytopes satisfying Gale's evenness condition (a combinatorial condition on facets relative to a fixed ordering on the vertices). Here we look at relaxing the simpliciality requirement, allowing faces to be from a certain class of generalized simplices, the "braxtopes." The resulting Gale and braxial polytopes turn out to be exactly the even-dimensional "periodically-cyclic Gale" polytopes, introduced earlier by Bisztriczky. For a certain order of the vertices and a certain integer  $k$ , the convex hull of any  $k$  consecutive vertices is a cyclic polytope. We compare these Gale and braxial polytopes with the odd-dimensional "ordinary" polytopes. (Received August 28, 2006)