MR1180650 (93k:52009) 52A55

Bavard, Christophe (F-ENSLY-PM); **Ghys, Étienne** (F-ENSLY-PM)

Polygones du plan et polyèdres hyperboliques. (French. English summary) [Polygons in the plane and hyperbolic polyhedra]

Geom. Dedicata **43** (1992), *no. 2,* 207–224.

The space of all convex n-gons in E^2 centered at 0 is an open subset of a vector space of dimension $2n - 2$. The additional requirement that the edges be parallel to a given n-tuple of lines leads to a space of dimension $n - 2$. Furthermore, a quadratic form of type $(1, n - 3)$ is introduced, leading to an interpretation as a subset of the hyperbolic space H^{n-3}. The authors describe the nature of this subset quite in detail. It turns out to be a convex polyhedron whose facets correspond to the degenerate case in which two subsequent vertices of the n-gons coincide. The authors' main interest is the case in which this polyhedron is an orthoscheme. The relation with Coxeter diagrams is discussed, and an alternative description is found for the list of hyperbolic orthoschemes recently given by H. C. Im Hof [Bull. Soc. Math. Belg. Sér. A **42** (1990), no. 3, 523–545; per revr.].

Reviewed by *Wolfgang Kühnel*