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Skip Garibaldi* (skip@mathcs.emory.edu), Dept of Math & CS, MSC W401, 400 Dowman Dr., Emory University, Atlanta, GA 30322. *The image of a root system in a Coxeter plane.*

The picture of E8 that appears in newspapers and magazines (popularized by the Atlas group) is the projection of the E8 root system in a Coxeter plane. We prove that the radii of the circles – sometimes called “Gosset circles” – in the picture are the entries in a Perron-Frobenius eigenvector for the Cartan matrix. The theorem is known, but by a roundabout proof; we give a very simple proof within the language of root systems. We apply the theorem to compute the radii. The motivation for all of this is that the ratio of the two largest radii in the E8 case has a physical interpretation which has recently been observed in the laboratory. (Received September 17, 2010)