1070-57-267 **Daryl Cooper** (cooper@math.ucsb.edu), PA, **David Futer*** (dfuter@temple.edu), Philadelphia, PA 19122, and **Jessica S Purcell** (jpurcell@math.byu.edu). *The geometry of unknotting tunnels.*

Given a 3-manifold M, with boundary a union of tori, an unknotting tunnel for M is an arc τ from the boundary back to the boundary, such that the complement of τ in M is a genus-2 handlebody. Fifteen years ago, Colin Adams asked a series of questions about how the topological data of an unknotting tunnel fits into the hyperbolic structure on M. For example: is τ isotopic to a geodesic? Can it be arbitrarily long, relative to a maximal cusp neighborhood? Does τ appear as an edge in the canonical polyhedral decomposition?

Although the most general versions of these questions are still open today, I will describe fairly complete answers in the case where M is created by a "generic" Dehn filling. As an application, there is an explicit family of knots in S^3 whose tunnels are arbitrarily long. This is joint work with Daryl Cooper and Jessica Purcell. (Received February 14, 2011)