1067-W1-1475 **Janet Heine Barnett*** (janet.barnett@colostate-pueblo.edu), Department of Mathematics and Physics, Colorado State University - Pueblo, 2200 Bonforte Blvd, Pueblo, CO 81001-4901.

Abstract awakenings in algebra: Teaching and learning group theory through the works of Lagrange, Cauchy, and Cayley.

The seeds of group theory can be recognized in several early nineteenth century mathematical developments. The common features of these apparently disparate developments were first explicitly recognized by Arthur Cayley (1812–1895). In his 1854 paper "On the theory of groups, as depending on the symbolic equation $\theta^n = 1$," Cayley defined a group as any (finite) system of symbols subject to certain algebraic laws, stated several important group theorems and proceeded to classify groups up to order seven. Although focused on general properties of arbitrary groups, Cayley motivated his work through references to specific nineteenth century appearances of the group concept. As a result, his paper provides a powerful lens on the process and power of mathematical abstraction.

In this talk, we examine a student module that uses excerpts from Cayley's own paper, together with pre-Cayley sources which frame its historical and mathematical context, as a means to develop elementary group theory in an undergraduate course. Results of classroom-testing and an overview of the rationale which guides the NSF-funded project *Learning Discrete Mathematics and Computer Science via Primary Historical Sources* that supported its development will also be presented. (Received September 21, 2010)