962-35-623   **Danny Arrigo** (`darrigo@mail.uca.edu`), Danny Arrigo, UCA Math Dept., Conway, AR 72035, and **Fred Hickling*** (`fredh@mail.uca.edu`), Fred Hickling, UCA Math Dept, Conway, AR 72035. *The nth order Darboux transformation for the heat equation factors.*

A class of nth order Darboux transformations is used to link the one-dimensional heat equation to a family of one-dimensional heat equations with source. A system of n+1 nonlinear partial differential equations is derived for the coefficeints of the Darboux transformation and is shown to be equivalent to a matrix Burgers' equation. Via a generalized Hopf-Cole transformation, this matrix equation is linearized, thus giving rise to the link between solutions of the two respective heat equations. The process involved in solving the system of nonlinear differential equations shows that the nth order Darboux transformation factors into a composition of n first order Darboux transformations (Received September 17, 2000)