1083-05-96 **Lex E. Renner*** (lex@uwo.ca), Department of Mathematics, Middlesex College, Western University, London, Ontario N6A 5B7, Canada. *Generalized Rook Monoids.* Preliminary report.

The starting point for this talk is the observation that the rook monoid R_n indexes the set of $B \times B$-orbits on the monoid $M_n(k)$ of $n \times n$ matrices over the field k. Here $B \subseteq Gl_n(k)$ is the subgroup of upper-triangular $n \times n$ matrices. But there is a much more general statement. If M is an irreducible, reductive monoid with unit group G, and Borel subgroup $B \subseteq G$, then the set of two-sided B-orbits $R(M) = B\backslash M/B$ has the natural structure of a finite inverse monoid with unit group W, the Weyl group of G.

Many familiar combinatorial notions "come from" R_n (e.g. Catalan numbers, Sterling numbers). And many of these can be generalized to $R(M)$, for any reductive monoid M.

But there are many interesting geometric questions here. (1) What if M is associated with the wonderful embedding? (2) What if $M \setminus \{0\}$ is rationally smooth? (3) What kind of combinatorics on $R(M)$ arises from the cell decomposition of M, and how do we compute the dimension of each cell? (Received August 22, 2012)