1056-05-17 **Richard P. Stanley*** (rstan@math.mit.edu), Department of Mathematics, M.I.T., Cambridge, MA 02139. *Alternating permutations.*

An *alternating permutation* $w = a_1 \cdots a_n$ of $1, 2, \ldots, n$ is a permutation such that $a_i > a_{i+1}$ if and only if i is odd. If E_n (called an *Euler number*) denotes the number of alternating permutations of $1, 2, \ldots, n$, then $\sum_{n \geq 0} E_n \frac{x^n}{n!} = \sec x + \tan x$. We will discuss such topics as other occurrences of Euler numbers in mathematics, umbral enumeration of classes of alternating permutations, longest alternating subsequences of permutations, and a connection with the *cd*-index of the symmetric group $\mathfrak{S}_n$. The *cd*-index is a noncommutative polynomial in the variables c and d that encodes the number of permutations $a_1 \cdots a_n \in \mathfrak{S}_n$ with specified values of i for which $a_i > a_{i+1}$. (Received August 26, 2009)