We investigate the nonlinear boundary value problem that is derived from a similarity transformation of the Navier-Stokes equations governing fluid flow toward a stretching permeable cylinder. Existence of a solution is proven for all values of the Reynolds number and for both suction and injection, and uniqueness results are obtained in the case of a monotonically decreasing solution. A priori bounds on the skin friction coefficient are also obtained. (Received September 22, 2009)