962-30-104 **Jonathan E. Huntley** (huntley@gursey.baruch.cuny.edu), , New York, NY 10010, and **Nam J Moh** and **David E. Tepper*** (tepper@gursey.baruch.cuny.edu), 17 Lexingotn Ave, New York, NY 10010. *Uniqueness of Solutions to a Free Boundary Problem.*

In *An Extesion of the Reimann Mapping Theorem, Acta Mathematica, Vol. 90, 1953,* A. Beurling studied the following free boundary problem. Let ϕ be a continuous and positive real valued function in the complex plane **C.** Can we find $\Omega \subset$ **C**. such that 0ϵ **C** and there exists an analytic function f from the unit disk to Ω such that $f(0) = 0$, $f'(0) > 0$, and

$$\lim_{|z|\uparrow 1}(|f'(z)| - \phi(f(z)) = 0$$

or $|f'(z)| = \phi(f(z)$, for $|z| = 1$? Beurling showed that this problem has a uniqe solution if $\log(\frac{1}{\phi})$ is subharmonic. We sho that there is a uniqe solution if

$$\frac{\phi(\rho w)}{\rho} > \phi(w)$$

for $\rho < 1$. We slao show that this solution will be convex if in addition $\phi(w) = \phi(|w|)$ and $\phi'(w) > 0$. (Received August 02, 2000)