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ON ESSENTIAL FIXED POINTS

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The purpose of this note is to furnish an affirmative answer to a question posed at the Summer Institute on Set Theoretic Topology held at the University of Wisconsin in 1955. Let X^X denote the space of continuous functions of X into X topologized by the compact open topology. A fixed point p of a map $f \in X^X$ is called essential if for each neighborhood U of p there is a neighborhood N of f such that if $g \in N$, then g has a fixed point in U.

THEOREM. *If X is a compact Hausdorff space which has the fixed point property, then there is an $f \in X^X$ such that each fixed point of f is essential.*

PROOF. Let x_0 be any element of X, and consider the map $f \in X^X$ where $f(X) = x_0$. Let U be any neighborhood of x_0. Then $N = \{g : g(X) \subset U\}$ is a neighborhood of f with the property that each $g \in N$ has a fixed point in U. Therefore x_0 is an essential fixed point of f. Since x_0 is the only fixed point of f, f is the required map.

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