RESEARCH ANNOUNCEMENTS

The purpose of this department is to provide early announcement of significant new results, with some indications of proof. Although ordinarily a research announcement should be a brief summary of a paper to be published in full elsewhere, papers giving complete proofs of results of exceptional interest are also solicited. Manuscripts more than eight typewritten double spaced pages long will not be considered as acceptable.

PERIODIC POINTS OF DIFFEOMORPHISMS

BY K. R. MEYER[1]

Communicated by S. Smale, May 1, 1967

I. **Introduction.** In [1] Artin and Mazur prove that there is a dense set in the space of C^k mappings of a compact manifold into itself such that for each member of this set the number of isolated fixed points under iteration grows at most exponentially. This estimate allows one to define an analytic ζ-function associated to the mapping that measures the number of isolated fixed points of the mapping under iteration.

The theorem of Artin and Mazur gives no indication as to whether or not a specific diffeomorphism satisfies such an estimate.

In this note we announce (Theorem 1) that the total number of fixed points of the general class of diffeomorphisms recently introduced by Smale [2], [3] grows at most exponentially under iteration. It should be noted that this new theorem is neither contained in nor contains the theorem of Artin and Mazur.

The method of proof is quite simple. One need only show that the size of the domain where there is a unique fixed point of the diffeomorphism decreases at most exponentially by using an estimate on the domain of validity of the implicit function theorem. The complexity arises only from the necessity of checking uniformity at each step.

II. **Notation and theorem.** Let M be a compact C^2-Riemannian manifold and suppose that $f\colon M\to M$ is a diffeomorphism of M. A closed invariant set $\Lambda\subset M$ is said to have a *hyperbolic structure* if the tangent bundle $T_\Lambda M$ of M restricted to Λ has a continuous invariant splitting $T_\Lambda M = E^u + E^s$ under df such that

[1] This research was supported in part by the National Aernoautics and Space Administration under Grant No. NGR 40-002-015 and in part by the National Aeronautics and Space Administration, Huntsville, under Contract No. NAS 8-11264.