SOME ASPECTS OF DYNAMICAL BEHAVIOR OF MAPS OF AN INTERVAL

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During the past few years a number of books, surveys and expository articles dealing with dynamical behavior of continuous functions have been written by biologists, physicists and mathematicians. The scope of the subject is large, touching on many parts of mathematics: ergodic theory, differential equations, complex analysis, and fractals among others. Those publications having primarily a real analysis flavor stress well-behaved functions. For example, for functions mapping an interval into itself, one usually assumes quite a bit of differentiability of the functions as well as certain other regularity conditions that lead to pleasing developments. Such requirements on the functions are natural since the types of functions that arise in practice meet these conditions. Yet, the functions that serve as models for practical problems in the biological, social and physical sciences may be imperfect, and it seems desirable to study the dynamical behavior of continuous functions that are not so well behaved. In some cases, a slightly imprecise model may cause no serious errors; in others, the errors could be very serious indeed. (Even when the function in use is perturbed to another well-behaved function, the perturbed function may possess dynamical properties very different from those of the unperturbed function.)

This area seems to be one in which the real analyst familiar with the behavior of continuous functions that are not necessarily well-behaved can make contributions.