incorrect, for the integral and Z_p cohomology rings are in fact independent of the Z_p action. The homotopy types can be distinguished only by getting chosen generators from the reduction of integral to mod p cohomology, or from the Hurewicz homomorphism. The most crucial mistake is in 14.8 on p. 311, where the author says that $\tilde{E}^0(B)=0$ if $\boldsymbol{E}$ is a connected spectrum when in fact one needs $\pi_q(E)=0$ for $q>0$. This error is compounded in the following discussions of orientation. In particular, 14.9 is false except for ordinary cohomology and the proof of 14.18 is only valid then. The exercise on p. 312 suffers badly from misprints but seems to involve the same error, and if I correctly interpret it, it is false.

R. STONG

BULLETIN OF THE
AMERICAN MATHEMATICAL SOCIETY
Volume 82, Number 2, March 1976

Almost periodic differential equations, by A. M. Fink, Lecture Notes in Mathematics, No. 377. Springer-Verlag, Berlin, Heidelberg, New York, 1974, vii+336 pp.

Nonlinear differential equations of higher order, by R. Reissig, G. Sansone and R. Conti, Noordhoff, Leyden, 1974, xiii+669 pp.

Functional differential equations, by J. K. Hale, Applied Mathematical Sciences, No. 3. Springer-Verlag, New York, Heidelberg, Berlin, 1971, viii+238 pp.

In this review we trace some of the major developments in the study of the qualitative behavior of solutions of ordinary differential equations and show how these books fit into this general theory.

I. **Origins of the qualitative theory.** The qualitative theory of ordinary differential equations began nearly a century ago with the work of H. Poincaré in France and A. Lyapunov in Russia. Prior to this time the major emphasis in differential equations had been on the methods of "solving" various equations either in closed form by an explicit formulation, or in terms of series, cf. Ince [**17,** pp. 529–539] for example. This interest in solving equations was undoubtedly influenced by the strong interconnection between the study of differential equations and the problems of physics. To put it in modern language, the existence of a solution is clearly the first logical step in establishing the validity of a given mathematical model for a physical phenomenon. Naturally, the first attempts at finding solutions were in terms of explicit formulae. This line of research reached its dénouement during the period from 1875 to 1900 when the work of Lipshitz, Picard, Peano, and others established the so-called fundamental theory, i.e., the theory of the existence, uniqueness and continuity of solutions. While investigations into the fundamental theory continue even today, one finds that the major emphasis in the study of ordinary differential equations now seems to be in the qualitative behavior of solutions.