In fact, the time seems reasonably near for an historically noteworthy combination of the algebraic theory of near-rings with the fields of nonlinear differential equations, nonlinear functional analysis and numerical analysis. One would be mistaken to dismiss the subject of near-rings as just a haven for out-of-work ring theorists.

J. W. NEUBERGER

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Qualitative analysis of large scale dynamical systems, by Anthony N. Michel and Richard K. Miller, Academic Press, New York, 1977, xv + 289 pp., \$22.50.

One of the challenges to system theory posed by present day technological, environmental and societal processes is to overcome the increasing rise and complexity of the relevant mathematical models. The amount of computational effort needed to analyze a dynamic process usually increases much faster than the size of the corresponding systems. Consequently the problems arising in large scale systems become either very difficult or uneconomical to solve even with modern computers. In view of this, it has recently been recognized that, for the purposes of stability analysis, control, optimization and so forth, it may be fruitful to decompose a large scale system into a number of interconnected subsystems, to fully utilize the information of these individual subsystems, and to combine this knowledge with interconnection constraints to obtain a solution of the original problem of the large scale system. Thus taking advantage of the special structural features of a given large scale system, one hopes to devise feasible and efficient piece-by-piece methods for solving such systems which are intractable or impractical to tackle by one shot methods.

It is well known that using a single Lyapunov function and the theory of differential inequalities, a variety of problems in the qualitative theory of differential equations can be studied. However, the usefulness of this approach is limited when applied to problems of higher dimension and complex interconnecting structures. It is also known that, in such situations, employing a vector Lyapunov function instead of a scalar Lyapunov function, is more advantageous since it offers a more flexible mechanism and demands less rigid requirements on each component of the vector Lyapunov functions. Many multivariable systems are composed of relatively simple subsystems or aggregates. By grouping variables of a large economy, for example, into a relatively small number of subeconomies, the economy is decomposed into several interconnected subsystems. Stability of the entire economy may be predicted by testing the lower order aggregated comparison subsystems.

Let E_i, $i = 1, 2, \ldots, N$, be Banach spaces. Consider the system of differential equations

$$x_i' = f_i(t, x_i), \qquad x_i(t_0) = x_{i_0}, \tag{1}$$

where $f_i \in C[R^+ \times E_i, E_i]$. Let $F_i \in C[R^+ \times E, E_i]$ where $E = E_1 \times E_2$