

given by Gentil et al. (p. 473). In addition to considering rather carefully questions of noise correlation and test signals, the authors provide a comparison of the results obtained by different methods, namely least squares, generalized least squares, maximum likelihood, and instrumental variables.

Aircraft and Transportation Systems

Several papers in the proceedings deal with the identification of aircraft dynamics including a survey by Rault (p. 49), a number of sophisticated case studies by Mehra and Tyler (p. 117), and an interesting application to ship dynamics by Åström and Källström (p. 415).

Biological and Economic Systems

A short survey of identification of biological systems is given by Bekey (p. 1123), and several other papers deal with specific systems such as the metabolic, the immune, the lungs, and the cardiovascular. Finally, there are three applications to economic models.

ADAPTIVE CONTROL

Although the IFAC Symposium was devoted to system identification and parameter estimation, it included a limited number of contributions to the closely related subject of adaptive control. Among these we may mention a paper of Peterka and Åström (p. 535) treating the design of self-adjusting regulators using an on-line identification technique, and a paper by Nikiforuk et al. (p. 555) on the control of a nonlinear plant of unknown structure. Finally, Ku and Athans (p. 571) consider a feedforward-feed-back suboptimal control for a linear system with randomly varying parameters.

CONCLUDING REMARKS

The proceedings contain material that should be of considerable interest to chemical engineers. The survey papers, especially those which compare various identification methods, give a much needed perspective about what methods are available, how they differ from each other, and under which conditions one method is more suitable than others. One cannot escape the conclusion that further research or applications by chemical engineers should not concentrate in further development of methods but should be focused on a critical evaluation of various assumptions required in applying various methods to specific processes. For example, the statistical nature of random dynamic or measurement errors deserves careful consideration. The design of test signals that do not seri-

ously disturb normal operation, yet provide an adequate excitation, is another. Among various specific applications presented, we recommend a careful study of those directed to power systems because of the serious effort made to utilize theory in a critical way. However, it must also be emphasized that most of this admittedly impressive work deals with linear models required for regulatory control. The modeling of complex nonlinear processes such as a catalytic cracking unit, with the objective of process design and optimization remains a virtually untouched area that will hopefully be taken up in all seriousness by chemical engineers.

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The McGraw-Hill Dictionary of Scientific and Technical Terms, Daniel N. Lapedes, Editor-in-Chief, McGraw-Hill Book Company, New York (1974). \$39.50

How does one review a scientific dictionary? Especially one with almost 100,000 definitions and 2,800 illustrations? Spot checking of chemical engineering terms, for example *Marangoni effect*, *bag filter*, *Sherwood number*, yielded positive results. The definitions were brief but well-written. *Drag reduction* was not included, but even a book of this size cannot be expected to be all-inclusive.

In fact, the dictionary is a fascinating book in which to browse and learn. Most scientific and engineering fields are covered and my vocabulary was expanded to include *bra vector*, *Robin Hood's wind*, *free gold*, among many.

I invited my friends to supply me with terms from their fields and the results were excellent in all cases but one. An ornithologist was outspokenly critical since birds seem to have been somewhat neglected. To make matters worse, worms seem to be well represented (try *Rhynchocoela*). Her retort was, what is a worm without a robin?

The book will be invaluable for libraries and for all companies which must deal with the technical or scientific community. For individuals, it would be a delightful addition to the bookshelf—and in many cases, of real value.

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industrial people such as Dr. Weekman. To allow the editor to print more of such articles, AIChE should give the *Journal* more pages per year.

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ERRATA

In the last column of Table 2b of the article "Computational Methods for Cylindrical Catalyst Particles," [*AIChE J.*, 19, 969 (1973)], 0.3682 should be 0.2682.

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In "Bisphenol A Synthesis: Kinetics of the Phenol-Acetate Condensation Reaction Catalyzed by Sulfonic Acid Resin" [20, 933 (1974)] by R. A. Reinecker and B. C. Gates, in Equation (4) and on the left-hand sides of Equations (5) to (7), the variable *C* should be replaced by θ , with θ defined as the fraction of sites occupied.

B. C. GATES