"slack" variable is usually applied to a variable which is introduced to transform an inequality to an equation, while an "artificial" variable is usually applied to a variable which is introduced to provide a basis-variable in the process of obtaining an initial solution.

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13 [W].—E. S. VENTZEL, *Lectures on Game Theory*, Gordon and Breach, New York, 1961, 22 cm., 78 p. Price $4.50.

The 78 pages of this book cover an elementary exposition of game theory in eight chapters touching on the object of the theory of games, the minimax principle, pure and mixed strategies, elementary methods of solution, general methods of solution of finite games (for example, linear programming), approximate methods and methods of solving a few infinite games. The book may give a good idea of the subject to the non-mathematician, particularly since it concentrates on elementary applied illustrations of game theory.

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14 [W, Z].—MARTIN GREENBERGER, Editor, *Management and the Computer of the Future*, John Wiley & Sons, Inc., and The M.I.T. Press, New York, 1962, xxvi + 340 p., 21 cm. Price $6.00.

This volume contains the proceedings of a series of eight lectures on the subject, Management and The Computer of the Future, sponsored by the School of Industrial Management of the Massachusetts Institute of Technology during the spring of 1961 in celebration of MIT's centennial. At each session the main speaker presented a paper, which was followed by prepared remarks by two discussants. After additional brief remarks by the speaker the meeting was opened for general discussion. The list of participants includes some of the best known experts in the field of computers, admixed with a sprinkling of "amateurs" and prominent names outside the field. The following are the topics covered at the individual sessions:

1. Scientists and Decision Making—C. P. Snow, Speaker; E. E. Morison and N. Wiener, Discussants; H. W. Johnson, Moderator.

2. Managerial Decision Making—J. W. Forrester, Speaker; C. C. Holt and R. A. Howard, Discussants; R. C. Sprague, Moderator.

3. Simulation of Human Thinking—H. A. Simon, Speaker; A. Newell, Coauthor; M. L. Minsky and G. A. Miller, Discussants; S. S. Alexander, Moderator.

4. A Library of 2000 A.D.—J. G. Kemeny, Speaker; R. M. Fano and G. W. King, Discussants; W. N. Locke, Moderator.

5. The Computer in the University—A. J. Perlis, Speaker; P. Elias and J. C. R. Licklider, Discussants; D. G. Marquis, Moderator.

6. Time-Sharing Computer Systems—J. McCarthy, Speaker; J. W. Mauchly and G. M. Amdahl, Discussants; E. R. Piore, Moderator.

7. A New Concept in Programming—G. W. Brown, Speaker; G. M. Hopper and D. Sayre, Discussants; P. M. Morse, Moderator.

8. What Computers Should Be Doing—J. R. Pierce, Speaker; C. E. Shannon and W. A. Rosenblith, Discussants; V. Bush, Moderator.

The lectures and discussions were generally held at a non-technical level. Thus the book constitutes an informative and authoritative compilation of the prevailing views concerning the impact which the development of computers may have upon the future—written in a style which can easily be understood by the scientist, administrator or layman. The large variety of subjects covered, the many excellent presentations and the spirited discussions evoked by the speakers all contribute to the enjoyment and value which the reader may derive from the book. It is difficult for the reader not to become personally engulfed in the diverse points of view expounded concerning the future impact of computers. He may find himself becoming an ardent Luddite (named for Ned Lud, a poor nineteenth century English stocking weaver who, finding his meager livelihood threatened by automation, went out and destroyed the looms in his city), or a partisan defender of computer supremacy. Notwithstanding the preeminent position held by many of the contributors in the field of computer technology, the reader is not likely to find any earth-shaking pronouncements or discoveries—for, as pointed out by Martin Greenberger, the editor, in the matter of predicting the future of so revolutionary a device the layman or "amateur" can successfully hold his own with the so-called expert. This was shown to be the case during many of the discussions.

H. P.

15 [X, Z].—FRANZ, L. ALT, Editor, *Advances in Computers*, Volume 2, Academic Press, 1961, xiii + 434 p., 23.5 cm. Price $14.00. [For a review of Volume 1, see *Math. Comp.*, v. 15, 1961, p. 220–221.]

In view of the extent and variable quality of the literature in our field nowadays, periodical critical surveys of topics of current interest by experts are especially welcome. The present volume contains five such articles, all provided with extensive bibliographies:

"A survey of numerical methods for parabolic equations," by Jim Douglas, Jr., p. 1–54;

"Advances in orthonormalizing computation," by Philip J. Davis and Philip Rabinowitz, p. 55–133;

"Microelectronics using electron-beam-activated machining techniques," by Kenneth R. Shoulder, p. 135–293;

"Recent developments in linear programming," by Saul I. Gass, p. 295–377;

"The theory of automata, a survey," by Robert McNaughton, p. 379–421.

The article by Shoulder—the one most closely related to the title of this series—is concerned with a research program leading to the fabrication of machines several generations in the future. The other articles are in or near the field of numerical analysis, but there must be very few, apart from the editor, who could appreciate both these and that of Shoulder.

The title of this series suggests that we might expect to see evaluations of procedures in practice on the machine, as well as on paper. Those given by Douglas are largely qualitative, but Davis and Rabinowitz denote more than half their article to the results of numerical experiments—material of this kind is invaluable to the conscientious practical computer. It is surprising that the method of ortho-