"Method of convex ascent," by Hubert Halkin (pp. 211–239), discusses a computational procedure for the solution of a class of nonlinear optimal control problems. The method is based upon properties of the reachable set. An elementary description is followed by a detailed one giving theorems and refinements. An application of the method to the Goddard problem indicates its usefulness and power.

"Study of an algorithm for dynamic optimization," by R. Perret and R. Rouxel (pp. 241–259), is a pragmatic approach, as the authors state, to the organization of a particular class of dynamical systems. An experimental computer has been constructed, and the experimental results are reported elsewhere.

The last three papers are concerned with the use of hybrid analog-digital computation, in an attempt to use the best features of each type of computer. These papers are entitled, respectively: "The application of hybrid computers to the iterative solution of optimal control problems," by E. G. Gilbert (pp. 261–284); "Synthesis of optimal controllers using hybrid analog-digital computers," by B. Paiewonsky, P. Woodrow, W. Brunner, and P. Halbert (pp. 285–303); and "Gradient methods for the optimization of dynamic systems parameters by hybrid computation," by G. A. Bekey and R. B. McGhee (pp. 305–327). The first two of these papers use algorithms based on the theory of time-optimal control, particularly the computational methods proposed by Neustadt and Eaton. Included are descriptions of computer programs and reports of computer studies.

As a whole, this book makes a valuable contribution in presenting under one cover our, as yet, primitive knowledge on the subject. In the opinion of this reviewer, it is the best book of its kind to date.

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100[X, Z].—Howard S. Bowman, *A Nomogram for Computing* $(a + jb)/(c + jd)$ *and a Nomogram for Computing* $| a + jb |/| c + jd |$, National Bureau of Standards Technical Note 250, U. S. Government Printing Office, Washington, D. C., 1964, ii + 13 pp., 26 cm. Price 15 cents (paperback).

Since $(a + jb)/(c + jd) = [(a/d + b/c) + j(b/d - a/c)]/N$, where $N = c/d + d/c$, the real and imaginary terms of the right-hand member can be computed on the same nomogram composed of three logarithmic scales.

The absolute value α of the ratio is determined by the use of three logarithmic scales, of which two are

$$L(x) = \log x - 1 \quad \text{and} \quad R(x) = 1 - \log x,$$

and the relation $2m(y) = L(\sqrt{(1 - y)}) + R(\sqrt{(1 - 1/y)})$, where $\log \alpha = 4m(\alpha)$.

The reviewer recalls a much simpler method which was described by Jesse W. M. DuMond in "(A complex quantity slide rule," in the *Journal of the American Institute of Electrical Engineers*, v. 44, 1925, pp. 133-139.) This used a chart on a drafting table. This method has been mechanized recently in a commercial cylindrical slide rule.

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