versus private power in the United States. The author's contention is that individual public power organizations start with a staff of very good employees who never intend to make that organization their life's work. They are replaced by others of lesser quality. In time, a large part of the staff consists of a somewhat mediocre group. The reason for the deterioration in the quality of the employees, he claims, are the higher rewards that private enterprise offers which are necessary to keep those of dedication within the organization. He states that this is true in other democratic countries as well, as, for example, in Britain and in France.

On the subject of research and development, the author states that privately owned companies are in a better position to carry out effective research than are public organizations because of their greater flexibility in setting up project teams and the longer continuity of their management compared to the public power sector.

The third lecture is entitled, "Protecting the Consumer Interest and the Public Interest." In the area of consumer interest he attempts to demonstrate that from the standpoint of availability of power, reliability of delivery, and price, that the United States has done an admirable job, particularly when compared to systems of the Soviet Union, Britain, France, and Italy, all of which are publicly owned. So far as the public interests are concerned, the author effectively demonstrates that utility management, of both private and public power, can be depended upon to respond to the concern of the public good, and he proves that point by citing a number of examples of past power crises.

The fourth lecture is entitled, "The Problems Ahead for the Electric Energy Supply Systems; Some Possible Developments in the United States." This is by far the most interesting of the lectures, and it is the only one where mention is made of cases where private power did not perform up to its potential. The author indicates that in the next 30 years a five-fold increase in electric energy will be required. Three hundred new generation sites, of an average size of 4500-MW each, will have to be developed. He discusses the various challenges to which the industry will have to address itself, such as the problem of fuels, the development of larger generating units, higher transmission voltages, system reliability, environmental pollution, and the costs of electric energy. He points out that in light of this growth and the difficult problems ahead, much research work will be required.

He concludes that it is his judgement, that in considering all the pros and cons of private and public power both in this country as well as abroad, that there really is no form of organization which can magically cope with all the problems that confronts the industry.

He recommends that a fair competitive relationship be brought about between the public and the private power sectors in the United States by changing the tax laws, eliminating financing subsidies, and regulating both public and private power sectors. Private power can then serve as a yardstick for public power and vice versa as is the case in the Swedish Power Supply System.

This book has been written in an interesting, provocative, and entertaining style, while tackling an important problem facing our society.

Modern Control System Theory and Application—S. M. Shinners (Reading, Mass.: Addison-Wesley, 1972, 528 pp.). *Reviewed by Richard G. Costello, Department of Electrical Engineering, Cooper Union, New York, N.Y. 10003.*

Over the past decade new wide-coverage texts of excellent quality, dealing with control theory, have appeared almost yearly. The newest text generally broadened the area of coverage, introducing material that previously was to be found only in specialized texts and original papers, so that the graduate level material of year N became the undergraduate material of year $N + K$. In recent years, as the feed-down time K has grown smaller, authors have taken another tack to broaden the scope of wide-coverage texts. They have incorporated increasing amounts of interdisciplinary material within the classical areas of coverage: an approach which not only broadens the text, but also appeals to growing societal preferences for interdisciplinary education.

Shinner's text is the present cynosure of this trend. Intended for the senior undergraduate student or the first-year graduate student, it reaches up to the calculus of variations, dynamic programming, and the maximum principle, and it reaches across into the fields of economics, bioengineering, physics, and dozens of other areas where problems can be solved by the methods of modern control system theory.

The basic development of the text rests upon a parallel presentation of classical and modern methods. Chapter 2, "Mathematical Techniques for the Control Engineer," expounds Fourier and Laplace transforms in the same breath with matrix algebra and state-space techniques. The mathematical detail extends down to the level of Laurent expansions, contour integrations, and Cauchy's theorem, but not to the level of proving theorems—a chore delegated to the references. Shinners possesses the relatively rare ability to clarify subjects with a minimum of verbiage. This allows him to cover all the areas of classical control theory including nonlinear system analysis, and still include a significant amount of modern control theory. Sampled-data control systems and stochastic control are the only major areas not covered.

Because of the extensive range of the text, certain shortcomings are unavoidable. Not every relationship is proven. The familiar phrase, "It can be shown that . . .", appears with regularity.

In contrast, the truly outstanding attribute of the text resides in the extensive problem sets where problems from many areas are examined by specific control techniques, e.g., flow graphs are employed in a problem dealing with interest accrual; Bodé plots are applied to analyze and compensate a model of the lunar excursion module; state equations are used to determine the half-life time of iodine 135 in a two-stage decay process; and root-locus techniques are applied to compensate a model of a large hydrofoil boat, the H. S. Denison. These problems, packed full of realistic details, and scores of others like them, provide a motivational tie between the abstract mathematical constructs and their practical applications.

The answer to every other problem is included in an appendix, as is a table of Laplace transforms.