Book Reviews

Systematizers

There exists in current society a segment devoted to the rationalization of the design and management of large systems. One might call it the "systems world" were it not that the sources of this segment are too diverse to answer to any single name. It includes much of what goes on in the fields of management science and operations research; much of what goes on in the development of weapons systems and space systems; much of what goes on in the manufacture, programming, and use of large-scale digital computers; with additional contributions from econometrics, modern control theory, and the like. It is this diverse group that forms the leading wedge of the transformation of our society into increasingly complex technological forms. It is the natural antagonist of our concern over automation, dehumanization, and the specter of 1984 or a Brave New World.

Robert Boguslaw is a sociologist who has resided in the midst of this segment for more than a decade. In this small book, **The New Utopians: A Study of System Design and Social Change** (Prentice-Hall, Englewood Cliffs, N.J., 1965. 223 pp., $6.35), he puts forward some observations based on that residence. His major thesis is that this segment constitutes the modern utopians —those who deliberately redesign society in a new idiom to solve the difficulties of the present. He does not judge these engineers and scientists to be witting utopians (although wittingly deliberate); it is only that, by virtue of their command over a rapidly expanding technology of information processing and control plus their iconoclasm with respect to existing features of social and industrial systems, they are the *de facto* successors to Plato (of *The Republic*), Thomas More, Herbert Spencer, and even such moderns as Orwell, Huxley, and Skinner.

Boguslaw has (at least three) minor theses. First and most important, the biggest difference between these modern utopians and their predecessors is that the earlier ones were fundamentally concerned with people; the modern ones are not. Instead, they are concerned with efficiency, reliability, and predictability—all of which lead to a somewhat jaundiced view of the human being. Since Boguslaw himself is deeply committed to the individual, he finds this characteristic distressing. The second minor theme is that moderns should be aware of their extended history, if only to avoid the errors of the past. Indeed, the main technique of the book is to range over the approaches to systems design, describing each in modern terms, and then bringing forth various utopians of the past who approached their problems of utopian design in the same way. Thus, the center four chapters (out of eight) are titled: "Formalist designs," "Heuristic designs," "Operating unit designs," and "Ad hoc designs." The third minor theme is directed towards his professional colleagues, the sociologists. The systems engineers and computer technologists have the initiative, he asserts; the sociologists and political economists now operate in a reactive mode. They study the effects of automation and the impact of technological change, but they do not propose the new social designs.

The strengths of the book stem from Boguslaw's wide knowledge of modern sociology, of the utopian tradition, and of the "systems world." Unlike many commentators, he has a firm grasp of the technological efforts. His description of it sometimes glints of caricature, but it is mostly legitimate oversimplification. The weaknesses stem from a certain confusion of audiences and a susceptibility to the occupational hazard of social commentators to have a say, along the way, about all the things they care about. On the first weakness, he wants to convince his fellow sociologists that they should grab the initiative, to educate his fellow technologists to a wider social context, and to provide the intelligent layman a glimpse into what is happening to his society. The demands for each are disparate and the text often wobbles between them. On the second, we are treated to additional themes—for example, where the power resides in social systems—that are both interesting and relevant, but end up defocussing the main theme.

The book is social commentary, by and large good commentary, of which there must be a great deal as we come to terms with our transforming society.

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Handbook of Physiology

Although the editors, Albert E. Renold and George F. Cahill, Jr., modestly disclaim for this volume, **Handbook of Physiology**, Section 5, **Adipose Tissue** (American Physiological Society, Washington, D.C., 1965. 832 pp., $28), completeness of coverage, the 69 papers, which cover 800 two-column, 8½ × 11 inch pages in 10-point type, with a bibliography of 4109 references, omit very little. The 69 papers, written by 79 authors, are roughly divided into three areas: (i) physiology and structure, 20 papers; (ii) metabolism of isolated adipose tissue, 28 papers; and (iii) regulation of metabolism in vivo, 21 papers. The last paper in each area is a summary.

It is pointed out by the editors that, in order to obtain various points of view of this active subject by their proponents, it was decided to present many relatively short papers rather than few long ones. The controversal aspects are thus emphasized.

Although one wonders whether another monograph on lipid metabolism is needed (this is the third on adipose tissue) the complete coverage of a field undergoing explosive growth does make this volume a valuable reference source and time saver. Its critically written chapters are also stimulating.

H. E. Wertheimer's "Introduction—A perspective" is most worthwhile reading. It is scholarly and imaginative, and demonstrates the depth and firm grasp of this pioneer's research on adipose tissue. Other very strong chapters are "Metabolic pathways in the insect fat bodies" by Alisa Tietz; "Glyceride bio-

synthesis, glyceride breakdown, and glycogen breakdown in adipose tissue: Mechanisms and regulation" by Martha Vaughan and Daniel Steinberg; "Comparative physiology of adipose tissue in different sites and different species" by Eleazar Shafrir and Ernst Wertheimer; "Triglyceride metabolism" by B. Shapiro, and "Pathological anatomy of adipose tissue" (27 pages) by C. G. Tedeschi.

Perhaps it is misleading to note a few strong chapters, because most of the volume is authoritative, well written, and critical, with excellent, though not exhaustive coverage of subject matter and references. Many of the papers are well illustrated. "The physiological role of brown adipose tissue" by Cliffe D. Joel has an illustration in color.

As might be expected, some chapters are not strong. An example is "Fat metabolism in fish." An area under active investigation over the past few years, the origin of the polyunsaturated fatty acids in marine fish, is not touched on, and only 30-year-old work on the relation between diet and body fat is referred to. The authors do not refer to their own work. As far as I know they have not published on the subject. A few other chapters were written by persons who have made relatively little contribution to the specific subject that they reviewed. While, theoretically, it may be argued that some scholars may be better able to discuss a subject than persons engaged in advancing knowledge, certainly those with both qualifications can be found.

Very few of the authors limited themselves to purely objective reporting of past work. Thus, in the chapter "Comparative anatomy of adipose tissue," Jean Vagne and Robert Fenasse propose eight groups of factors responsible for the development and distribution of fat within human adipose tissue. In the chapter "Fatty acid patterns in human adipose tissue" Jules Hirsch devotes considerable space to sources of error in gas liquid chromatography of the fatty acids in adipose tissue.

A large number of the chapters contain original data—"Adipose tissue in migratory birds" by Eugene P. Odum, "The physiological role of brown adipose tissue" by Cliffe D. Joel, and "Enzymes in carbohydrate metabolism" by G. Weber, H. J. Hird, N. B. Stamm, and D. S. Wagle. But shouldn't original data be deposited in the technical journals?

The references are all collected alphabetically (senior author) at the end of the volume; they include titles. They are followed by a "Code of subject index to bibliography" which classifies the subjects covered. The next section repeats this index, listing the numbers of the references under each. Finally, there is a list of all authors quoted, with reference numbers. The last three parts of this complex cross-index are not all useful, whereas there is no way to trace a listed reference back to the paper in which it is quoted.

This is a well printed book, though some may find 10-point print small. It is printed on 10-pound coated paper, bringing its weight to almost 6 pounds.

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Chromatography Series

"Advances in . . . " are appearing thick and fast, and one wonders who buys them and what purpose they serve. The purpose, it seems, is to provide review articles more extensive than those appearing annually or biennially in technical journals, but briefer and more up-to-date than book-length monographs. The specialist will buy the standard books on his subject and keep them within easy reach. He will buy *"Advances in . . ."* for his own use only if there are articles of special value to which he will refer again and again.

The initial volume of **Advances in Chromatography**, edited by J. Calvin Giddings and Roy A. Keller (Dekker, New York, 1965. 408 pp. Illus. $14.50) contains at least half a dozen chapters that make it worth buying [the ten chapter titles were listed in *Science* **152**, 1498 (10 June 1966)]. "Teaching chromatography and electrophoresis on paper and thin layers," by Ivor Smith, is of value to the educator and especially to the teacher of biochemistry. It also gives a quick idea of what can be done with paper chromatography and electrophoresis and what equipment is used.

"The techniques of laminar chromatography," by E. V. Trutter, is a fine supplement to Randerath's book on thin-layer chromatography and is self-contained in its own right. "The stationary phase in paper chromatography," by G. H. Stewart, shows what can be done with a very complex system by combining chemical and mathematical insights. "Capillary columns: trials, tribulations and triumphs," by D. H. Desty, is an exceptionally lively and well-written essay reflecting the personal experiences of one of the most active workers in the field. The concluding paragraph recounts the investigation of coffee essence by A. I. M. Keuelmans, and is so delightful that it will be quoted many times. "Inorganic gas chromatography," by R. S. Juvet and F. Zado, has 406 references, nearly all later than 1959, and is a most valuable review of a burgeoning field.

More than half the book deals with gas chromatography, the remainder with liquid chromatography. The first chapter, by F. Helfferich, with 377 references, reviews recent advances in ion-exchange chromatography. It summarizes a lot of information, with useful periodic-table charts of distribution data, and has some general observations on elution and displacement and on concentration profiles. Helfferich has made perceptive and original theoretical contributions to this field, and I look forward to their publication.

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Techniques for Chemistry

One of the contributors to **Applied Infrared Spectroscopy** (Reinhold, New York, 1966. 576 pp. Illus. $23) quotes R. B. Woodward to the effect that "no single tool has had a more dramatic impact upon organic chemistry than infrared measurements." Few people would dispute this sweeping statement, or similar ones which have been made about the importance of infrared spectroscopy to other branches of chemistry. The infrared spectrum probably provides the greatest variety of information, on the largest number of chemical compounds, which can be obtained from a single relatively simple instrument.

Applied Infrared Spectroscopy, edited by David N. Kendall, is a collection of articles, written mostly by industrial spectroscopists, which discuss the application of infrared methods to a variety of chemical problems. As the title indicates, the emphasis is on practical industrial problems, ranging from the differentiation between East Indian and West Indian oil of nutmeg to the