

many sources about the organization and modification of brain patterns according to experience. Finally, Pribram introduces the concept of "feedback" and "feed forward" in neural mechanisms and suggests the phrase: "Test-Operate-Test-Exit (TOTE)" to describe an elementary neural servomechanism. Here, the "Test" phase is related to the junctional, the "Operate" to the nerve-impulse component of brain function.

Part 2 is entitled "The Organization of Psychological Processes" and surveys widely and deeply every aspect of experience. There are more facts and original hypotheses than can be fairly summarized; one satisfying outcome is the re-establishment of the validity of subjective experience as an inference from the two-process concept. The bases of memory and the concept of feature-detection as a function of phase-coherence of junctional patterns are considered in detail, with the optical hologram as the distinct analogy. In a careful discussion of "feelings", Pribram suggests that some of the paradoxical results of experiments involving core-brain systems may be understood by postulating a "go-motivational" with a "stop-emotional" mechanism. He concludes with a cybernetic theory of motivation and emotion in which cortical influence on deeper structures is invoked from empirical factors.

These considerations are developed in Part 3: "The Neural Control and Modification of Behavior". This deals with movements and actions and the basic concepts of contingency, expectancy and innate competence. Here the author builds a link between fields as remote as ethical categories and the intimate details of neurochemistry, with reference to learning, achievement and the means-end relation in reinforcement.

Part 4 is perhaps the most challenging; it extends the discussion to analysis and learned conjectures on animal and human communication. This is too intricate and wide-ranging to summarize intelligibly; the great words talk and thought are discussed with scholarly respect, with reference to the accepted facts of anatomy and physiology, and it ends with a gentle and penetrating essay on the regulation of human affairs. Here, Pribram expresses a "post-critical, biologist's view", which he describes as "a form of constructional realism" with a proposal for a "structural pragmatism".

As well as the great mass of experimental material, discoveries and penetrating conjectures, there is a personal epilogue that opens with the sentence, "The making of this book held many surprises for me". This will be true, in the happiest sense, of the reader, however experienced in brain research.

There are twenty pages of bibliography and excellent author and subject indexes.

W. GREY WALTER

Supplying Voltage

Power Supplies for Electronic Equipment. By J. R. Nowicki. Vol. 1: Pp. xxi + 321; £6.50. Vol. 2: Pp. xxi + 224; £5.80. (Leonard Hill: London, September 1971.)

In these two volumes Mr Nowicki has set out to provide a comprehensive treatment of the subject; only rotating machines and other mechanical devices seem to be omitted. The first volume starts with a detailed discussion of the characteristics of semiconductor rectifiers and transistors: particular attention is given to the thermal and other limitations which affect their use in power supplies. He then deals with methods of rectifying alternating voltages to produce d.c. supplies and includes a treatment of polyphase rectifiers used for high power applications. Inversion from d.c. to a.c. and the conversion from one direct voltage to another are also dealt with. Almost every method which has been used is considered, including "fly-back" and r.f. oscillator methods of providing high voltage supplies for television receivers. Every method described is analysed in some detail.

Volume two deals mainly with regulated power supplies and a bewildering variety of circuits is given together with an analysis of their operation. Here again nothing seems to have escaped his notice and he deals at some length with the problems of obtaining a stable reference voltage and with the methods of protecting circuits against overloads. Apart from the many variations of the simple shunt and series stabilizing circuits, he devotes a chapter to circuits using switching methods to achieve close voltage control; this chapter is, however, rather more descriptive in nature than most of the others. The last two chapters are devoted to a more detailed description of inverter circuits. The two volumes contain a great deal of useful material. It is likely to be of more value to an engineer who already has some experience with power supplies than to a beginner. This is because the author gives a great deal of impartial description and analysis. Though he compares one circuit with another he leaves it to the reader to form his own preferences. In a topic such as this it would be helpful if the author from his own expertise would provide a "child's guide" to the choice of the simplest circuit which would give a desired performance.

On the whole the two volumes provide a very useful reference work.

W. E. LOVERING

Laser Technology

Laser Applications. Vol. 1. Edited by Monte Ross. (Academic: London and New York, September 1971.) \$16; £7.45.

FIVE experts here describe some of the developments in their own fields in the last ten years. The result is a very useful and readable book which helps to fill in the gap between laser research and applications in useful products and instruments. The volume is well produced, with adequate American references. Misprints are few.

Each author treats his section from his own standpoint, giving his first-hand interests most space, though in some cases the account seems to support an implication that the author moved to other work some time ago. Thus the scope of each section is not exhaustive, and plenty of room remains for sections in future volumes giving complementary and updated contributions within the compass of the titles of the present sections.

The volume is in five sections. Brian J. Thompson gives a straightforward introduction to the fundamentals of holography, followed by a selection of developments. Particle size analysis is followed through to several well developed systems; it would be interesting to hear what these systems have achieved and how the techniques compare with competing technologies.

A clear and detailed account of some of the measurements made at the ESSA Research Laboratory is given by James C. Owens in his section on "laser applications in metrology and geodesy".

The daunting problems which arise, and the ingenious techniques evolved in the development of the laser gyro, are described by Frederick Aronowitz. The discussion seems to be limited to early models, perhaps for security reasons.

In the discussion of machining and welding, by Leland A. Weaver, too much space is devoted to a survey of lasers, and the result is a rather restricted account.

Monte Ross discusses the basis of choice of communications systems which suit existing requirements, but scarcely mentions terrestrial possibilities. His good account of laser communications is inevitably restricted because experience in the field of communication in space had hardly begun at the time of writing, so that little is said about real systems.

The volume title may be slightly misleading. "Applications", in the sense of proved products or techniques, are not described: this volume describes only laser technology aimed at potential applications. Perhaps future volumes will pursue the development of some of these topics into the final stage, giving