

terations in composition of the blood and urine following its use.

An excellent section on local anesthetic drugs brings out the chemistry, the general systemic and the toxic effects of this widely used, but little discussed, group of drugs.

A few of the other important problems considered are premedication, technic of administration of the various volatile agents, an evaluation of the "circle" and the "to and fro" carbon dioxide absorbers, postanesthetic complications, and a discussion of fires and explosions.

A glossary of pertinent chemical and physical terminology, a posologic table, and a well arranged index enable the anesthesiologist to make quick and easy reference.

The volume's comprehensive bibliography will be a valuable aid to the student; its emphasis upon the physiological and pharmacological aspects of anesthesiology makes it a helpful guide for the teacher; its streamlined, yet complete, form will provide the busy internist and surgeon with a ready answer to his occasional anesthetic problem.

"The Pharmacology of Anesthetic Drugs" is in no sense a manual on the *how* of Anesthesiology; it is the most extensive and readable *why* that has ever been compiled.

D. H. B.

Control of Pain in Dental Practice.

J. L. T. APPLETON, D.D.S., Acting Dean and Professor of Bacterio-Pathology, Evans Dental Institute, University of Pennsylvania. 189 pages, 16 illustrations. Philadelphia, J. B. Lippincott Company, 1940. Price \$3.00.

Fear of pain attending dental operations still ranks foremost among the real or fancied fears of people in all walks of life.

This book represents the collected

papers of authors carefully chosen for their exceptional competence in their respective fields, the end result being an excellent treatise on the modern methods of controlling pain in dental practice. It is divided into eight chapters, the first four of which deal primarily with the anatomic, physiologic, psychologic and psychiatric aspects of pain and pain control; the latter half assumes the more practical consideration of the pharmaco-dynamics of the various drugs employed in the control of pain. A short chapter on the early history of pain control is included, as is a very practical clinical report of the importance of the physical factors in the control of pain in dental practice.

The chapter on anatomy is unique in that very little time is spent reviewing the accepted anatomic descriptions of the nerves involved in the distribution of pain in dental disease. The author has very properly confined his remarks to the pain more difficult to diagnose. His clear and concise interpretations are based on an accurate knowledge of the anatomy involved, and will undoubtedly be of invaluable assistance to every practitioner.

The controversial subject of the innervation of the dentin has been presented in great detail. As might be expected, no conclusion was reached, but to one interested in the subject, a complete bibliography, both pro and con, is appended to the chapter.

The physiology of pain reiterates accepted principles of conduction of nerve impulses and the individual susceptibility to threshold stimuli for pain. The author has aptly outlined the reflex response to pain as it may affect the skeletal and autonomic systems, and has also established the basis for referred pain to characteristic areas on the face and neck as may be projected from the teeth and their adnexa.

Chapter 4 deals with the psychologic and psychiatric aspects of pain and pain control and is most informative. It presents much helpful material in evaluating the patient and his problem of pain. However, the statement "that trifacial neuralgia (according to Dr. Frazier) is never due to dental disease" is very controversial. Recently, Livingston, reporting in the *Western Journal of Surgery, Gynecology and Obstetrics*, April, 1940, says, that "patients with symptomatic trifacial neuralgia, in whom the pains are indistinguishable from the idiopathic type, have been cured by the removal of pathological conditions of the teeth, jaws and sinuses." This view is also shared by such authorities as Goff, Poppen and others.

The chapter on the pharmacology of the drugs used in the control of pain is indeed a classic. Every conceivable point has been clarified and nothing is left to the imagination of the reader. The results of modern investigations regarding the toxic effects from absorption of local anesthetic drugs and the prophylactic measures employed to prevent their occurrence have been emphasized. The author concurs in the general belief that novocaine is the safest, least toxic and least irritant of all the local anesthetic drugs, and cautions against the use of newer preparations and their proprietary claims intimating that with many of the other local anesthetic drugs toxicity and irritant properties increase with the efficacy of the drug. The desired local effects and the undesired systemic ones depend on the concentration of the drug locally and in the blood stream, respectively. The portion of this chapter devoted to agents used in general anesthesia deserves some comment. In modern anesthesia parlance, we would prefer to classify nitrous oxide, ethylene, acetylene and cyclopropane as gaseous anesthetic agents and not as

volatile agents. Into this latter category we would relegate such agents as ether, chloroform, ethyl chloride and divinyl ether. The implication of "certainly when poisoning to the point of unconsciousness is being induced and maintained," to express inducing and maintaining anesthesia by inhalation methods, appears to be poorly stated. It creates a rather unfavorable impression in the mind of the reader, admitting the fact that all inhalation anesthetic agents are poisons. The author clearly recognizes the dangers of the other methods of producing unconsciousness, and admonishes his readers relevant to the comparative safety of inhalation anesthetic techniques.

The problem of anoxia during the administration of nitrous oxide and ethylene for anesthesia has been stressed. "To wait until the pulse is weak" as indicative of anoxia is not commonly accepted. The anoxic pulse is a full bounding pulse. To discontinue the administration of nitrous oxide immediately upon the "first sign of weakness of the pulse" may be too late as that may be indicative of an already failing myocardium. The reader is also reminded of the fact that although 20 per cent oxygen concentration is maintained in the respired mixture, anoxia is not necessarily eliminated. This percentage may be depleted by diminished tidal exchange, obstruction to the airway, mucus, etc. It would appear that more emphasis could have been stressed on the importance of maintaining a free and unobstructed airway at all times.

The problem of intravenous anesthesia for dental use is discussed in some detail and is summed up as follows: "the hazards of intravenous anesthesia are greater than with any form of anesthesia unless given by one with special skill and experience, and is not a thing to be employed without careful selection of patients and with-

out the proper equipment for combating emergencies that are likely to arise." "Favorable results get into the literature in profusion, but it takes unusual courage and civic consciousness to publicize one's unfavorable results." The above speaks for itself.

In the short chapter on the early history of anesthesia, one typographical error is very apparent—the name is William T. G. Morton and not William P. G. Morton.

The closing remarks on drugs used in the control of pain include many useful prescriptions for all painful dental conditions. Exception may be taken to the maximum amounts of novocaine solutions as recommended by the author. The usual accepted maximum amount of novocaine employed without producing toxic effects should not

exceed 50 cc. of a 2 per cent solution, 100 cc. of a 1 per cent solution, and 250 cc. of a $\frac{1}{2}$ per cent solution. The author supports the view that many of the commercial claims for vasoconstrictor drugs employed with the novocaine solutions in place of epinephrine have not been substantiated. Cobefrin, for instance, was found to be as depressing to respiration as were any of the other vasoconstrictor agents. It also causes severe tachycardia and increases the toxicity of the novocaine solution.

This book presents a complete and comprehensive review of all the modern advances employed in the control of pain in dental practice. It rightfully deserves a place of honor in the library of every progressive dental surgeon.

S. S. L.