left many readers with the impression that Dramamine is a basically new agent with unique pharmacological and therapeutic properties. All the articles cited failed to mention the fact that Dramamine is simply an organic salt of a compound, the hydrochloride of which has been recognized by the Council on Pharmacy and Chemistry for several years under the official name of *diphenhydramine* and which has been widely marketed and prescribed under the trade name *Benadryl.*

An additional note on Dramamine (Cusic, John W. *Science*, 1949, **109**, 574) has suggested that formation of the 8-chlorotheophylline salt might reduce the sedative effect that is not uncommonly observed with diphenhydramine. However, absolutely no pharmacological or clinical evidence was presented to substantiate this contention. Available pharmacological data point to the conclusion that 8-chlorotheophylline, in the amount administered (45 mg orally), would have little or no detectable pharmacological action. This dosage of theophylline is essentially inactive in man and the 8-halogen substitution appears to reduce all pharmacological properties of the parent compound (Green, D. M., *et al. Fed. Proc.*, 1949, 8, 296). From these considerations, it appears highly improbable that the therapeutic properties of Dramamine and diphenhydramine differ significantly except inasfar as the heavy anion in Dramamine may reduce the percentage of active substance.

Science is a publication designed primarily for the broad dissemination of scientific information and not as an organ for the purpose of launching proprietary pharmaceutical preparations. It may be hoped that in the future the constituents of proprietary salts or mixtures may be more clearly identified for those readers who fail to stop and translate chemical descriptions into terminology commonly applied to the active principles involved.

MARK NICKERSON

University of Utah
Salt Lake City

Book Reviews

Atomic Medicine. Charles F. Behrens, Ed. New York: Thomas Nelson, 1949. 416 pp. $7.50.

This timely volume dealing with medical aspects of nuclear science represents an attempt by a group in the Navy to provide a source of basic information primarily regarding radiation derived from radioactive isotopes. The book is written in simple language and can readily be understood by anyone with scientific training. The terminology peculiar to radiologists has been carefully avoided except when it adds clarity to the discussion. There are chapters dealing with the pathology of total body irradiation, the physical background for radioactivity, ionizing radiations and their biological effects, methods of detection and measurement of radiation, tracer methods in the biological application of radioisotopes, the atomic bomb in action in Japan and the planning necessary to deal with an atomic bomb explosion in the future.

In any field that suddenly becomes of great and widespread interest, a newcomer needs information that is hard to find in scattered papers in the literature. By meeting some of his needs it is inevitable that those demands not met should stand out in glaring relief. Although Cronkite, Geschickter, and Copeland in particular have provided numerous references to the literature in the fields covered by the chapters they contributed, it is to be regretted that more specific references were not provided for readers who want to go to original sources. The greatest omission was a thorough discussion of dosimetry of radioactive isotopes. An understanding of the principles and methods of calculation of radiation delivered by the administered isotopes is a prerequisite to their intelligent use by the physician.

More ruthless editing would have eliminated duplications in the historical background supplied by the various contributors. This would have removed an unnecessary sense of repetitiveness that the reader now gets from the book. The styles of the various authors, although showing individual differences, are sufficiently similar to give a homogeneity to the book not always found in joint efforts.

The chapter on the design and operation of laboratories employing radioactive isotopes in medical research will be most helpful to those not yet acquainted with many of the specific requirements of such installations. The hazards are pointed out without alarm and means for combating them described.

The book is pleasing in format, the figures and illustrations are clear, and typographical errors are at the absolute minimum.

LEE E. FARR

Brookhaven National Laboratory

Medical Etymology: The History and Derivation of Medical Terms for Students of Medicine, Dentistry, and Nursing. O. H. Perry Pepper. Philadelphia: W. B. Saunders, 1949. 263 pp. $5.00.

This little volume of less than 4,000 words makes no pretense of being a dictionary; it is a history of medical terms for students of medicine, dentistry, and nursing. The author, an eminent internist, has observed the change in premedical education from emphasis on Greek and Latin in days gone by to the current deletion of the classic and more rigid requirements in the biological and physical sciences. The impact on the present-day student entering medicine, dentistry, or nursing of a new and bewildering terminology creates confusion and unquestionably contributes to the high attrition in the freshman year. Not only must he master the discipline but he must learn simultaneously a new language—a task for

which he is unprepared. In former days training in Greek and Latin gave him an acquaintanceship with word-building from prefixes and suffixes, the compounding of roots, which helped greatly in understanding new words.

The medical terms with their descriptions are grouped under subjects beginning with *Anatomy*, just as the student would first encounter them in the preclinical years; then the vocabulary of the clinical subjects follows. It is perfectly obvious that the author has spent long hours in writing this book and that he derived a tremendous amount of pleasure from the task. The reader will have real difficulty in putting the book down once he has opened it to find the origin of a word. It is fascinating reading.

There are occasional errors, such as the designation of Sir James Bruce for Sir David Bruce in the creating of the genus *Brucella*. These can easily be changed in subsequent printings. The book should be in the hands of every student.

MALCOLM H. SOULE

University of Michigan

Supersensitivity of Denervated Structures: A Law of Denervation. Walter B. Cannon and Arturo Rosenblueth. New York: Macmillan, 1949, 245 pp. $5.50.

This book is a suitable companion to *Autonomic Neuroeffectors* published by the same authors in the Macmillan Series of Experimental Biology Monographs in 1937, and is the 21st and last of the joint publications of these two authors. Approximately half of the 22 chapters were completed by Prof. Cannon before his death; the remainder were written jointly or by Dr. Rosenblueth.

The phenomenon of sensitization of effectors as a result of denervation has long been known and has challenged such distinguished physiologists as Sherrington, Elliott, and Langley. Sixteen chapters of this book are devoted to detailed examples of the phenomenon of supersensitivity after denervation. Smooth muscle—for example, nictitating membrane and uterus—gives larger responses and has a lower threshold for sympathin and adrenalin some days after the sympathetic nerve supply has been cut than when normally innervated, and postganglionic denervation is more effective than decentralization. Depriving smooth muscle, like that in blood vessels, of its cholinergic nerve fibers, whether these normally excite or inhibit the muscle, accentuates the response to acetylcholine and related drugs. Similar supersensitivity is observed in melanophores of fish, in submaxillary and lacrimal glands, in vertebrate hearts, and in skeletal muscles after cutting the nerves which innervate them. Sympathetic ganglia show increased sensitivity to acetylcholine and potassium after the preganglionic fibers are cut; also to nerve impulses, as demonstrated by partial denervation. In the central nervous system there are several examples of increased responsiveness after transection of tracts impinging on certain regions; some of these instances can be interpreted as the functional opening of preexisting paths but some represent true supersensitivity of neurons. Spontaneous activity, such as muscular fibrillation and asynchronous impulses from sympathetic ganglia after denervation, is interpreted by the authors as indication of supersensitivity. In general the excitability and responsiveness increase gradually during several days after denervation.

> When in a functional chain of neurons one of the elements is severed, the ensuing total or partial denervation of some of the subsequent elements in the chain causes a supersensitivity of all the distal elements . . . and effectors if present, to the excitatory or inhibitory action of chemical agents and nerve impulses; the supersensitivity is greater for the links which immediately follow the cut neurons and decreases progressively for more distal elements.

In the final chapters several theories of sensitization are explored. These include: disuse or inactivity of the denervated structure, removal of trophic influences, decrease in cholinesterase content, and increased permeability of the cells of the denervated tissue. There is evidence for each of these theories but no one of them can account for all of the known facts of the supersensitivity after denervation. The phenomenon of sensitization has important implications with respect to persistent changes in excitability in the central nervous system—for example in reorganization of behavior after injuries. Clinical applications are mentioned but not considered in detail.

This book is a careful summary of the examples of supersensitivity after denervation, many of these examples coming from work done at the Harvard Medical School. The authors are cautious in their interpretation, and the reader is left with the feeling that here is a phenomenon ripe for investigation in terms of cellular physiology.

C. LADD PROSSER

University of Illinois

Scientific Book Register

The Sea and Its Mysteries: An Introduction to the Science of the Sea. John S. Colman. London: G. Bell and Sons; New York: British Book Centre, 1950. 285 pp. 12s. 6d. net.

Phenomena, Atoms and Molecules: An Attempt to Interpret Phenomena in Terms of Mechanisms or Atomic Molecular Interactions. Irving Langmuir. New York: Philosophical Library, 1950. 436 pp. $10.00.

An Introduction to the Study of Experimental Medicine. Claude Bernard; trans. by Henry Copley Greene. New York: Henry Schuman, 1949. 226 pp. $3.00.

Science and the Goals of Man: A Study in Semantic Orientation. Anatol Rapoport. New York: Harper & Bros., 1950. 262 pp. $3.50.

The Separation of Gases. 2nd ed. M. Ruhemann. New York: Oxford Univ. Press, 1949. 307 pp. $6.00.

Proceedings of the Inter-American Conference on Conservation of Renewable Natural Resources, Denver, Colorado, September 7–20, 1948. Department of State Publ. 3382. Washington, D. C.: U. S. GPO, 1949. 782 pp.

Laboratory Fractional Distillation. Thomas P. Carney, New York: Macmillan, 1949. 259 pp. $5.75.