chloramide[4]) 1: 5000; dihydrostreptomycin sulfate 40 mg. The azochloramide and dihydrostreptomycin were added as dry powders to the broth solution just before it was dispensed into the flasks. The flasks, each containing a single *Ascaris*, were then placed in large vacuum desiccators (18 flasks/desiccator) containing 300 ml of freshly prepared 20% alkaline pyrogallol solution, and these were evacuated quickly to a residual pressure of 60 mm Hg. Atmospheric pressure was restored with cylinder nitrogen gas, and the process was repeated twice. The pyrogallol served to remove oxygen present as impurity (0.2%) in the nitrogen gas. Desiccators and contents were incubated in a water bath in a constant temperature room for 4 hr, after which 1 ml of penicillin solution (30,000 units) was added to each flask and anaerobic treatment continued for an additional 4 hr. The treatment solution was then drained off and replaced with 50 ml of nutrient broth containing 0.45% NaCl and adjusted to pH 7.8. The worms in this broth were incubated either aerobically or anaerobically for 36 hr.

Most flasks at the end of 36 hr showed no visible bacterial growth. Transfers (0.15 ml) were made to broth tubes for aerobic and anaerobic culture. At the same time the worms were placed in fresh broth (pH 7.0) and incubated for a further period of 24 hr, after which fresh transfers were made. Observation of flasks and transfer tubes was continued for at least 96 hr, and usually for one week or longer. Proof of sterility was taken as the continuing absence of growth from flasks and transfer tubes. Since the microorganisms dealt with were derived solely from the intestinal flora of the host (pig), culture media other than nutrient broth were unnecessary.

Repeated experiments, using 9–27 worms per experiment, showed clearly that an average of 85% of the individually treated worms could be made axenic. In a very few instances yeasts persisted in the absence of bacteria, but growth of molds and fungi was never observed. For reasons that are not understood, 8 hr *aerobic*, rather than *anaerobic*, treatment gave consistently poorer results. Continuing efforts are being made to produce a more completely efficient method.

The decontamination procedure as described has no apparent harmful effects upon the parasite. Motility and viability are unimpaired, and the intestine appears normal when examined histologically. Eggs are produced, and develop motile embryos, but no statistical comparison of egg production and development in treated and untreated females has been made.

It is hoped that this method, or a modification thereof, will prove useful when applied to other nematodes. In a single experiment we were able to prepare axenic cestodes (*Raillietina cesticillus*) in apparently unharmed condition, after 10 min aerobic exposure to the treatment solution.

[4] A generous supply of Azochloramide N.D.A. was kindly provided by Wallace and Tiernan Products, Inc., Belleville, N. J.

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Book Reviews

Physico-Chemical Constants of Pure Organic Compounds. J. Timmermans. New York: Elsevier, 1950. 693 pp. $12.50.

According to the author, "this work records, as completely as possible, those physico-chemical constants of organic compounds which have been measured with sufficient care to warrant their acceptance as data established with a precision worthy of contemporary science." The criteria which qualify a substance by its purity, and a constant by its exactness for acceptance are stated in the initial pages of the volume. Necessarily, both go together, and the principles followed by the author in the selection make highly instructive reading for anyone interested in the problems that arise when compounds are purified and constants are measured in accordance with rigorous standards. These few pages are followed by more than 600 pages of tables which give a critical selection of the constants of more than 1,600 substances. The compounds are arranged according to a lucid chemical system, and their location in the tables is further facilitated by an empirical formula index and by a subject index. A bibliography completes the book.

It cannot be the objective of this review to analyze in detail the tables of constants. For each individual compound are given the preparative data relating to purity, and the constants listed include critical constants, vapor pressure, boiling point, freezing point, density, specific heat, latent heats, viscosity, surface tension, refractive indices, and other data like heat of combustion, critical density, etc., depending on the available values. Where more than one independent measurement qualifies for listing, the results of each are given.

Anyone who has faced the job of finding in the literature the most reliable physical constants for the most highly pure compounds will be grateful to the author for the stupendous task he has accomplished. The work is one of the fruits of a quarter-century's activity of the International Bureau of Physico-Chemical Standards, of which the author is director. It combines the results obtained in the laboratories of this institution with the data provided by a systematic survey of the literature by a man who is familiar with the intricacies of pure compounds and of exact measurements, This has been accomplished with the support of the Belgian Chemical Industry and the Belgian National Fund for Scientific Research. The user of the book will benefit from the

author's devotion to pure compounds and from his passion for exactness. The work is a monument to the patience and perseverance of a scientist who devoted his labors to the purification of compounds and to the measurement of exact constants, and whose attitude is set forth in the statement on page 9, "for the truth alone is unique, while error is manifold."

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The Clinical Use of Radioactive Isotopes. Bertram V. A. Low-Beer. Springfield, Ill.: Charles C Thomas, 1950. 414 pp. $9.50.

Some of the clinical medical applications of radioactive isotopes have now pervaded the fields of endocrinology, surgery, clinical physiology, dermatology, gynecology, and many other medical specialties in addition to radiology and biochemical research. The effort required to understand the background of atomic physics and to appreciate the potential applications of radioactive materials to specific medical problems has been a forbidding prospect for most physicians. This volume is an admirable attempt to correlate necessary information, and the book presents it in quite readable form.

The discussion of radiation physics in nonmathematical language occupies the first part of the book, and the basic essentials of atomic structure and the properties of radioactive atoms are logically covered without unnecessary detail. Those who anticipate considerable work with isotopic materials will need to consult the more complete reference sources given at the end of this part, but a surprisingly complete scope of the subject is made available here. In addition, there are excellent chapters on equipment and the units used in detection and measurement, as well as notes on the handling and disposal of radioactive materials.

The clinical applications are covered in the second part of the volume, which is divided into sections on diagnostic investigations, dosage determinations, and therapeutic applications. The nature of the uses that have been found for isotopes is responsible for what seems to be a succession of unrelated subjects as individual isotopes are discussed. This section will also most quickly become obsolete, for many of the clinical uses are in exploratory stages, but the situation is fairly evaluated up to the publication date. Furthermore, the principles here discussed will remain valid for later changes in method, and the preliminary section on physics ensures that the reader will have the requisite basic information to apply his understanding to new fields.

It is appropriate that emphasis should be placed on the physiological data accompanying isotopic distribution in the body, and that specific dosages and clinical techniques are largely confined to those isotopes that have already shown reasonably permanent worth, particularly radioactive phosphorus and iodine.

The volume is suitable for use as a text for students whose work will include use of isotopes in clinical research or therapy, and it should be required reading for radiologists, radiological physicists, and physiologically minded physicians. It will be a valuable reference work for physicians in almost every medical field.

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Biology of Drosophila. M. Demerec, Ed. New York: Wiley; London: Chapman & Hall, 1950. 632 pp. $10.00.

This book, some ten years in the making, represents primarily reports of original research by the authors on aspects of the biology of *Drosophila.* Under the editorship of M. Demerec, the authors, Kenneth W. Cooper, B. P. Sonnenblick, D. F. Poulson, Dietrich Bodenstein, G. F. Ferris, Albert Miller, and Warren P. Spencer, have contributed chapters on normal spermatogenesis, early embryology, histogenesis, organogenesis, and differentiation in the embryo, on postembryonic development, external morphology, internal anatomy and histology, and on collection and laboratory culture, respectively. The emphasis is on *Drosophila melanogaster,* with pertinent information on other species of the genus and on related organisms. The numerous photographs and drawings are with few exceptions original. A deliberate restriction to discussion of the wild type form serves to keep the volume from becoming unwieldy, although the apparent necessity of avoiding discussion of the pertinent information on mutant types is regretted by this reviewer —as is the almost total absence of reference to *Drosophila* physiology.

In any work of this magnitude, there are bound to be statements which to some readers seem equivocal. For example, in the chapter on postembryonic development, Bodenstein, in describing the venation of the prepupal wing, states (p. 297) that "they are apparently not identical with the later imaginal veins (Waddington, 1939)." Waddington, *loc. cit.* (*Proc. Nat. Acad. Sci.,* **25,** 299), actually states that "This venation is not *altogether* [reviewer's italics] identical with that of the adult; . . . ." In view of the possibility that the prepupal venation may be in part homologous with the wing venation of subsequent stages, Bodenstein's citation would seem to this reviewer to be misleading. (It should be added that there is no reference to Waddington's more extensive description of wing development in the *Journal of Genetics,* **41,** [1941].)

To the *Drosophila* worker, long plagued by the scattered and fragmentary nature of the literature on the biology in *Drosophila,* this book should prove to be an invaluable reference manual.

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