

BIOLOGICAL
HANDBOOKS

Biology Data Book

Division of American
Experimental Biology



Biology Data Book

COMPILED AND EDITED BY

Philip L. Altman and Dorothy S

PREPARED UNDER THE AUSPICES OF THE Committee on Biological Handbooks

Federation of American Societies for Experimental Biology

WASHINGTON, D. C.

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FOREWORD

Users of the *Biology Data Book* are expected to be drawn from persons at all levels of biology. The expert research worker will find authoritative material in fields outside his specialty, with complete references so that he can get the detailed information he may desire. The early student of biology will be able to find life spans or pathways of metabolism for most plants and animals commonly used for study. Through use of the index, readers can get a great deal of information on a particular animal order or plant family. The appendixes provide information on taxonomic classification, conversion factors, and sources of supplies.

This book represents a general data book derived in part from a series of handbooks prepared for use by specialists. *Blood and Other Body Fluids* (1961) and *Growth, including Reproduction and Morphological Development* (1962) are two which have been published by the Federation of American Societies for Experimental Biology. Earlier volumes in the series were prepared under the auspices of the National Academy of Sciences - National Research Council; the first of these appeared in 1952. It is expected that as other specialized handbooks are produced, material in the *Biology Data Book* will be brought up to date in that field of specialization. Collection of data for a handbook on *Environmental Biology* is under way, with publication planned for 1966.

Responsibility for fields to be covered and guidance on the nature of the final product rests with the Committee on Biological Handbooks. For each book an Advisory

Committee meets as often as is necessary in order to determine what should be included, and what should be excluded from the volume. On the basis of their extensive research and teaching experience, they make suggestions as to authorities in particular fields who should be asked to contribute their services. Original tables are sent in by one or more contributors. When necessary, these are integrated by the staff and sent to two or more reviewers for critical evaluation. With the aid of Committee and Advisory Committee members, the staff have been able to obtain remarkable cooperation in this and in previous volumes. The staff compile the data into tables that conform to our standards, and after review they compose and edit these. Because of the nature of the study it has been found more efficient to have composition, editing, indexing, and preparation of camera-ready copy done entirely within the office of Biological Handbooks.

The Committee on Biological Handbooks acknowledges with thanks the contribution of 470 botanists, zoologists, and basic medical scientists who have contributed so generously with their time and advice. The Committee wishes to thank the National Institutes of Health, the National Science Foundation, and the Aeronautical Systems Division of the United States Air Force for the generous support and cooperation which have made possible the production of this book. Participation in this undertaking was fulfilled under National Institutes of Health Grant No. GM 06553, National Science Foundation Grant No. GN 255, and Air Force Contract No. AF 33 (657)-10802.

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INTRODUCTION

The *Biology Data Book* is a volume of broad scope and limited coverage designed to serve as a basic reference in the field of biology. It is a radical revision of the *Handbook of Biological Data* published in 1956 by the W. B. Saunders Company.

Much has been learned over the past eight years from users of the old handbook. In order to incorporate their suggestions for improvement, i.e., larger type, literature citations, and a detailed index, it became obvious that the number of tables to be included in the *Biology Data Book* would have to be restricted to a more discriminating selection. The Committee on Biological Handbooks assigned the task of choosing the basic tables for the new general reference book to a specially appointed *Biology Data Book* Advisory Committee. Copies of the old handbook and of the specialized volumes in the Biological Handbooks series were sent to the members of the Advisory Committee, who used these books for two years in daily work situations. On the basis of frequency of referral, the Advisory Committee selected 143 tables for extensive revision and updating, and recommended the inclusion of 12 additional tables containing data of fundamental importance and current relevance.

The space limitations affecting subject coverage also imposed restrictions on the number of species to be included in the *Biology Data Book*. The Advisory Committee approved a list of approximately 400 species, which included the more common animals and plants, certain physiologically unique forms, and the size extremes within taxonomic groups. Frequently data were not accessible for a plant or animal appearing on the list, but were available for a related form. In such cases, the information for the related organism was used in the tabulation. In the tables on toxins and parasitism, the inclusion of data was dependent on whether the victim or host, rather than the offending organism, appeared on the approved list.

The *Biology Data Book* has been organized in the form of quantitative and descriptive tables, charts, and diagrams, and arranged in 13 sections for the convenience of the user. Contents of the volume have been authenticated by 470 leading investigators in the fields of botany, zoology, and medicine. The review process to which the data have been subjected was designed to eliminate, insofar as possible, material of questionable validity and errors of transcription.

An explanatory headnote, serving as an introduction to the subject matter, may precede a table. More frequently, tables are prefaced by a short headnote containing such important information as units of measurement, abbreviations, definitions, and estimate of the range of variation. To interpret the data, reading of the related headnote is essential.

The main conventions used throughout the data book have been adapted from the *Style Manual for Biological Journals*, published in 1960 for the Conference of Biological Editors by the American Institute of Biological Sciences. The terminology has been checked against *Webster's Third New International Dictionary*, published in 1961 by G. & C. Merriam Company.

Appended to the tables are the names of the contributors, and a list of the literature citations arranged in

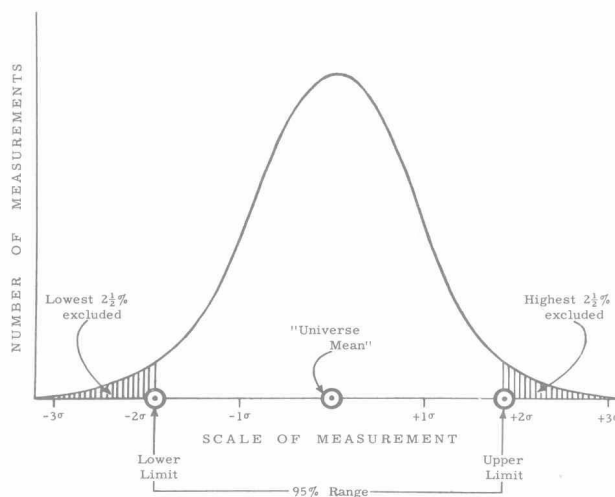
alphabetical sequence. The reference abbreviations conform to the 1961 *Chemical Abstracts List of Periodicals* published by the American Chemical Society.

It is suggested that the table of contents be used in conjunction with the index: the table of contents to determine the scope of the data for a particular topic, and the index to locate data for a specific subject or organism. To facilitate identification, the index includes the taxonomic orders for animals, and the family for plants.

.....

Values are generally presented as a mean and the lower and upper limit of the range of individual values about the mean. This range may be estimated in several ways, the method depending on the information available. Letter designations (a, b, c, d) identify types of ranges in descending order of accuracy.

(a) When the group of values is relatively large, a 95% range is derived by curve fitting. A recognized type of normal frequency curve is fitted to a group of measured values, and the extreme 2.5% of the area under the curve at each end is excluded (*see illustration*).



(b) When the group of values is too small for curve fitting, as is usually the case, a 95% range is estimated by a simple statistical calculation. Assuming a normal symmetrical distribution, the standard deviation is multiplied by a factor of 2, then subtracted from and added to the mean to give the lower and upper range limits.

(c) A less dependable, but commonly applied, procedure takes as range limits the lowest value and the highest value of the reported sample group of measurements. It underestimates the 95% range for small samples and overestimates for larger sample sizes, but may be used in preference to the preceding method where there is marked asymmetry in the position of the mean within the sample range.

(d) Another estimate of the lower and upper limits of the range of variation is based on the judgment of an individual experienced in measuring the quantity in question. The trustworthiness of such limits should not be underestimated.

ABBREVIATIONS AND SYMBOLS

Measurements

ht	= height	wt	= weight
mi	= mile	lb	= pound
ft	= foot	g	= gram
in.	= inch	kg	= kilogram
m	= meter	mg	= milligram
km	= kilometer	μg	= microgram
dm	= decimeter	μμg	= micromicrogram
cm	= centimeter	mEq	= milliequivalent
mm	= millimeter	gr	= grain
μ	= micron	M	= mole
mμ	= millimicron	mM	= millimole
Å	= Ångström unit	μM	= micromole
yr	= year	L	= liter
mo	= month	ml	= milliliter
wk	= week	μl	= microliter
da	= day	I.U.	= international unit
hr	= hour	ppm	= parts per million
min	= minute	vol %	= volume percent
sec	= second	°C	= degrees centigrade
cgs	= centimeter-gram-second	°F	= degrees Fahrenheit
rpm	= revolutions per minute	cal	= calorie
ft-c	= foot-candle	kcal	= kilocalorie
atm	= atmosphere	BTU	= British thermal unit
sq	= square	>	= greater than
cu	= cubic	<	= less than

Biological and Chemical Specifications

♂	= male	<i>d</i>	= <i>dextro</i> (rotatory)
♀	= female	<i>l</i>	= <i>levo</i> (rotatory)
sp.	= species (singular)	<i>D</i>	= <i>dextro</i> (in configurational sense only)
spp.	= species (plural)	<i>L</i>	= <i>levo</i> (in configurational sense only)
po	= oral	<i>m</i>	= meta
rec	= rectal	<i>o</i>	= ortho
sc	= subcutaneous	<i>p</i>	= para
im	= intramuscular	<i>M</i>	= molar
ip	= intraperitoneal	<i>N</i>	= normal, or <i>nitro</i>
iv	= intravenous	<i>O</i>	= <i>oxy</i>
RBC	= red blood cell (erythrocyte)	<i>S</i>	= <i>sulf</i> or <i>sulfo</i>
WBC	= white blood cell (leukocyte)	STP	= standard temperature and pressure
CNS	= central nervous system		
CSF	= cerebrospinal fluid		

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