INTRODUCTION

This handbook, compiled for reference purposes, offers quantitative data on growth, reproduction, and development, arranged in 13 sections for the convenience of the user. The material is organized in the form of tables, graphs, diagrams, and charts. Most of the tables have been prepared especially for the Biological Handbooks Series from various collections of data and from the current literature. Contents of the volume have been authenticated by 372 leading investigators in the fields of biology and medicine. The review process to which the tables 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 handbook 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. On the advice of taxonomists, the use of scientific names has prevailed for the organisms appearing in this volume. In most of the tables animals have been listed in descending phylogenetic order, and plants in ascending order. For a few tables the contributors urged that an alphabetical arrangement be employed, and their wishes have been honored.

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 *List of Periodicals abstracted by Chemical Abstracts*, and the 1957-1960 supplements thereto, published by the Chemical Abstracts Service.

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 organism. To facilitate identification, the index includes the taxonomic order for vertebrates and invertebrates, and the family for plants. Common names of organisms appear in the index only when no scientific name has been specified.

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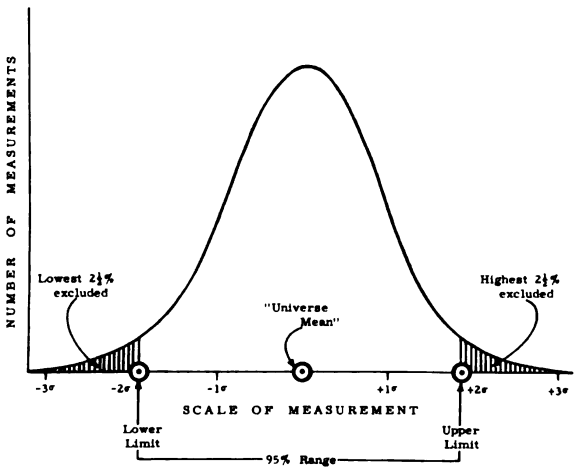
Values are generally presented as a mean and the lower and upper limit of the range of individual values about the mean. This range may be estimated in several ways, the method depending on the information available. Letter designations (a, b, c, d) identify types of ranges in descending order of accuracy.

(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.