GUIDE TO PRACTICAL WORK IN ELEMENTARY ENTOMOLOGY: AN OUTLINE FOR THE USE OF STUDENTS IN THE ENTOMOLOGICAL LAB.,ORATORY OF CORNELL UNIVERSITY

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649231195

Guide to Practical Work in Elementary Entomology: An Outline for the Use of Students in the entomological lab.,Oratory of Cornell University by J. Henry Comstock

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

www.triestepublishing.com

J. HENRY COMSTOCK

GUIDE TO PRACTICAL WORK IN ELEMENTARY ENTOMOLOGY: AN OUTLINE FOR THE USE OF STUDENTS IN THE ENTOMOLOGICAL LAB.,ORATORY OF CORNELL UNIVERSITY

Trieste

(A FRAGMENT OF A)

GUIDE

TO

5463

PRACTICAL WORK

IN

ELEMENTARY ENTOMOLOGY,

AN OUTLINE

FOR THE USE OF STUDENTS IN THE ENTOMOLOGICAL LABORATORY OF CORNELL UNIVERSITY.

BY

PROFESSOR J. HENRY COMSTOCK.

ITHACA, NEW YORK.

Stereotyped and Printed at the University Press.

1882.

PREFACE.

ONE-FOURTH of the time assigned to Entomology in the courses in which it is a required study in this University is devoted to lectures. In these lectures the more general questions and the greater number of the facts which it is deemed desirable to give the students are discussed. The remaining three-fourths of the time is devoted to work in the laboratory and in the field. In this part of the course it is my desire that the students shall learn how to study Entomology. No effort is made to teach the student facts merely as facts; but it is hoped that each one will learn how to ascertain for himself the truths of Nature.

Owing to the limited time which the majority of students can give to Entomology, it is impracticable, even if it were desirable, to follow the so-called Agassiz method; by which a student is at first given a specimen and required to ascertain all that he possibly can, unaided, respecting it. I have in the beginning of the course, after an exposition of the nomenclature used, followed the method adopted by Huxley and Martin in their Elementary Biology. Later, after the student has acquired a knowledge of the terms used in Entomology and of the methods of investigation, subjects are assigned which he is expected to investigate with the minimum of assistance.

J. HENRY COMSTOCK.

ITHACA, N. Y., Dec. 1881.

INTRODUCTION.

PRACTICAL work in Entomology consists of the making and recording of observations respecting insects, and the study of the records of observations made by others.

In order to describe insects intelligently or to understand the descriptions of them written by others, it is necessary to know the names applied by naturalists to the different parts of insects, and the terms by which the position and direction of these parts are indicated. For this reason Part I of this course is devoted to *Anatomical Nomenclature.* In Chapter I a set of terms by which the position and direction of parts may be designated is discussed. In subsequent chapters the names by which the parts of insects are known are defined and illustrated by reference to specimens which the student is supposed to be studying. Part II of the course is devoted to the details of the methods of Entomological investigations.

PART I.

CHAPTER I.

TERMS DENOTING POSITION AND DIRECTION OF PARTS.

(§ 1.) **Need of a more exact nomenclature.**—The use of the terms upper, lower, inner, outer, before, behind, anterior, posterior, and similar expressions in the technical descriptions of animals or of their parts, has led to much ambiguity. A great part of the confusion has doubtless arisen from the fact that very many of the early naturalists were physicians; and they attempted in their descriptions of lower animals to avail themselves of the same terms that were in use in human anatomy. But as the natural position of man differs from that of the lower animals, in being erect, these terms in one case have a different signification from what they do in the other. For example, when applied to man, *before* means in the direction indicated by a line drawn from the center of the body to the ventral surface; in the lower animals it means in the direction indicated by a line drawn from the center of the body to the head. The same difficulty attends the use of the term anterior; and, of the opposites of these terms, behind and posterior.

There is another source of confusion in the use of this class of terms. It is the fact that they are very commonly applied with reference to the plane of the horizon. Thus *above* means towards the zenith; *below*, towards the nadir; and *before* and

behind indicate directions parallel to the plane of the horizon. And thus whenever the position of an object is changed the terms denoting the relation of parts must be changed. An example illustrating this is given in § 7.

(§ 2.) **Proposed improvements in nomenclature.**— From time to time efforts have been made to establish a more exact nomenclature for the purpose of designating the position and direction of parts of animals.[1] But as yet no system has been generally adopted. For several years Professors Wilder and Gage have been earnestly endeavoring to perfect a system which, while it should involve the minimum of change in the nomenclature now in use, should include, "So far as practicable, only such terms as are brief, simple, exact, significant, of classical origin, and capable of inflection." And which should thus facilitate the recognition of parts by students, lessen the labor of memorizing, abridge the length of descriptions and at the same time *increase their accuracy*.

The result of their labors is a system which embodies the best features of the previously proposed systems, and makes a notable advance in the field of terminology.

In the preparation of this outline I have adopted such parts of this nomenclature as are applicable to entomology. I will therefore explain the principal features of it.[2]

The names of the various parts and appendages of the body of an insect will be given in subsequent chapters of this work. Here we have only to deal with terms denoting *position* or *direction* of parts.

---

[1] The most important of the earlier efforts was made by Dr. John Barclay, the anatomical preceptor of Professor Owen, who published in 1803 a volume of nearly two hundred pages, entitled *A New Anatomical Nomenclature Relating to the Terms which are expressive of Position and Aspect in the Animal System.*

For the titles of other papers on this subject see the work cited in the next note.

[2] I shall define only the terms which I have found necessary in the preparation of this outline; and shall define these as briefly as possible. For a fuller discussion of the subject, the student is referred to the "Guide to Practical Work in Elementary Anatomy, Histology and Experimental Physiology" by Professors Wilder and Gage.

It will be seen that the method which I have adopted to explain these terms differs slightly form that of Wilder and Gage, but the results obtained are the same.

These terms naturally fall under three heads: *nouns*, *adjectives* and *adverbs*.

(§ 3.) **Nouns.**—In this place it is necessary to define only three nouns, the second and third of which are derived from the first; these are *meson*, *dorsimeson*, *and ventrimeson*.[1]

MESON, DORSIMESON, and VENTRIMESON.—Frequently the position or direction of parts is referred to an imaginary plane dividing the body into approximately equal right and left halves. This middle plane is called the *meson* (τὸ μέσον, the middle).[2]

If it is necessary to refer to the lines constituting the dorsal and ventral borders of the meson, these are designated as the *dorsimeson* and *ventrimeson* respectively.[3]

EXAMPLE.—The wing covers of a beetle meet without overlapping on the dorsimeson.

(§ 4.) **Adjectives.**—The adjectives will be defined later; they end in *al*.

EXAMPLES.—Dorsal, ventral, mesal.

NOTE.—Cephalic and intermediate are exceptions to this rule.

(§ 5.) **Adverbs.**—The adverbs are formed by substituting for the adjective ending the letters *ad*, the Latin equivalent of the English ward.[4]

EXAMPLES.—From the adjectives dorsal, ventral, and mesal are formed the adverbs dorsad, ventrad and mesad. Thus a part which extends towards the meson is said to extend mesad.

(§ 6.) **Compound words.**—In forming compound words indicating direction, the vowel *o* is substituted for the termination of the first member of the compound.

EXAMPLES.—Dorso-ventral, caudo-cephalic, dextro-sinistral.

(§ 7.) **Points to which the position and direction of parts may be referred** *(dorsal, ventral, cephalic, caudal,*

[1] First proposed by Wilder, (Science Vol. II, p. 124); meson is, however, the equivalent of *mesion*, which was proposed by Barclay (*l. c.* page 121), but does not appear to have been adopted by any subsequent writer.

[2] Other body planes have been suggested to which to refer the position and direction of parts; but as the meson is the only one which exists in nature (in other words, the only one respecting the position of which there can be no doubt) and as the other planes are not really necessary, I shall omit any discussion of them.

[3] Respecting the propriety of the use of *dorsimeson* and *ventrimeson* and other hybrid words see Wilder and Gage *l. c.* page 28.

[4] This was first proposed by Barclay *l. c.* page 165.