

**LABORATORY
WORK
WITH MOSQUITOES**

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Laboratory Work with Mosquitoes by W. N. Berkeley

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W. N. BERKELEY

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PREFACE.

Besides personal acknowledgments in the text, my sincere thanks are due to Miss Marion Satterlee and Dr. Louise Cordes for the devotion and care they have given the illustrations, in the making of which no pains have been spared to reproduce faithfully the objects drawn.

The laboratory facilities of the Pediatrics Laboratory and of the Presbyterian Hospital, and the clinical material of the Third Division of Bellevue Hospital have been placed at my disposal ever since I began, some years ago, the studies this book is based on. Without the help thus generously extended I should have been able to accomplish nothing.

Messrs. William Wood and Company, of New York, have courteously loaned the plates of several drawings first appearing in an article of mine in the *Medical Record* for December 23, 1899. These illustrations are individually acknowledged as they occur.

Of the chapter on *Stegomyia* Theobald both the text and illustrations have been furnished by Dr. Aristides Agramonte, U. S. Army Medical Service, Havana, Cuba. As the first authoritative and complete account of *Stegomyia fasciata* so far published I believe this chapter to be of peculiar value.

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The key to the *Culicidæ* is virtually a reprint of Mr. D. W. Coquillett's contribution to Dr. L. O. Howard's recent work, *Mosquitoes*. It is reproduced here with the consent of the gentlemen named, to whom I must record, both for this and many other courtesies, my deep obligations. This book is meant in a measure to be a laboratory supplement to Dr. Howard's more popular and extensive volume.

My own purpose has been to give only the information needed for successful experiment in the laboratory upon the *Culicidæ* as the hosts or possible hosts of parasites having an additional life-cycle in man or other vertebrates. I may scarcely hope that amid such a multitude of difficult and minute details mistakes of greater or less gravity have not crept in. For such, as many as there be, I can only beg the reader's indulgence.

If excuse for this diffident effort be required, I cannot offer it in better words than those of Dr. Patrick Manson, to whose genius and patience humanity owes perhaps as large a debt of gratitude as to that of any physician in the last hundred years:—

“Full knowledge of all that concerns the etiology of malaria will only be attained when we have full knowledge of the various species of mosquito capable of subserving the germ, of certain vertebrates which may be capable of taking the place of man in the malarial cycle, of their geographical distribution, of their habits, and of their enemies. As yet this knowledge is but beginning. . . . Whether certain species of *Culex*

may not be efficient hosts for the Plasmodium, as they certainly are for *Proteosoma* and *Filaria nocturna*, can as yet be neither affirmed nor denied. Studies in this field are being actively carried on, so that in a very few years important additions to our knowledge of great practical value may be confidently expected."

W. N. B.

121 East Twenty-sixth Street.
January, 1902.

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LABORATORY WORK WITH MOSQUITOES

CHAPTER I.

DEVELOPMENT AND MODE OF LIFE OF THE CULICIDÆ.

CULEX.

The developmental cycle of the numerous species in this genus is fairly typified by *Culex pungens* Wied., and may be briefly described as follows:

The eggs are laid upon water. They are minute ovoid bodies, 0.6 to 0.8 mm. long, larger at one end, black in color after exposure to air and usually grouped by lateral adhesion into small masses that float on the surface. The axis of the eggs is vertical and the larger end points down. Several hundred eggs are said to be commonly laid in one mass.

The larva (the common "wiggler") emerges in from 16 hours (1)* to 3 days after oviposition,—according to temperature. It escapes from the larger (lower) end of the egg, and begins at once an active life in pursuit of food. The figure (Fig. 1) will supply all needful description. It should be specially noted that the breathing tube or siphon (projecting upward from the penultimate abdominal ring) is thick and long, and that the head of the larva hangs well below the surface of the water, the long axis of the body being more nearly vertical than horizontal. Habitually, therefore,

* Numerals in parenthesis refer to the List of Authorities in the back of the book.