A COMPEND ON BACTERIOLOGY: INCLUDING ANIMAL PARASITES

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BLAKISTON'S ? QUIZ-COMPENDS ?

A COMPEND

ON

BACTERIOLOGY

INCLUDING ANIMAL PARASITES

BY

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PREFACE.

This little book was designed by the writer to serve the needs of the medical student preparing for examination, and for the practitioner of medicine who desires to acquaint himself with the principal facts of the rapidly growing science of bacteriology. An effort has been made to reduce the subject matter to as concrete a form as possible.

While the literature of the subject of immunity is as vast almost as the rest of bacteriology, yet it is hoped that the chapter in this book on immunity gives in outline the essential accepted teachings on the subject.

Minute details of cultures and technic are not given. They must be sought for in books on descriptive bacteriology.

The author has drawn very freely from many standard text-books. Many illustrations are from Kalle & Wasser-mann's Atlas, Williams, McFarland, Tyson's Practice and Abbott.

The writer's best thanks are tendered to Dr. Herbert Fox of the University of Pennsylvania (Pepper Laboratory) to whom entire credit is due for the chapters on filterable viruses; the rearrangement of chapter, and the new matter that has been added throughout the book.

To the firm of P. Blakiston's Son & Co. the writer is indebted for valuable aid.

ROBERT. L. PITFIELD.

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COMPEND OF BACTERIOLOGY.

CHAPTER I.

THE CLASSIFICATION, MORPHOLOGY, AND THE BIOLOGY OF BACTERIA.

BACTERIA (fission fungi or **schizomycetes**) may be defined as very minute, unicellular vegetable organisms, almost always devoid of chlorophyll, (and generally unbranched,) that reproduce themselves asexually by means of direct division or fission, spores or gonidia. They are allied closely on the one hand to the higher fungi, such as the moulds, and on the other to the algæ. Many forms in one phase of development closely resemble members of other groups, and it has always been difficult to classify them. Various botanical classifications have been employed by different bacteriologists. The following one is based somewhat upon *Migula's*, and that adopted by *Lehmann and Neumann*, which was compiled from the systems of *Flügge, Fischer, Löffler, and Migula.*

CLASSIFICATION. Bacteria may be conveniently divided into six families, according to their morphology or shape.

I. **COCCACEÆ.** **Spherical** or **spheroidal bacteria** (Globular in free state but usually seen with one axis slightly larger. They do not have parallel sides like the bacilli.) To multiply, the cell divides into halves, quarters, or eighths, each of which grow again into perfect spheres. Endospores and flagella are very rare. (*Lehmann and Neumann.*) If mobile they are called Planococcus or Planosarcina.

(a) **Streptococcus.**—Cells that divide in one direction only and grow in chains.

(b) **Micrococcus.**—Cells that divide in two directions, or irregularly; with this group **staphylococcus** may be classed. Also tetrads, which form into fours by division in two directions.

(c) **Sarcina.**—Cells that divide in three directions so that balelike packages, or blocks of eight are formed. At least one variety (Sarcina agilis) is motile, having flagella. Plates of cocci, one thick in the plane, are called "*merismopedia.*"

II. **BACTERIACEÆ.**—**Rod bacteria** are straight or slightly curved. Each cell is from two to six times as long as broad. Division takes place in one direction only, and at right angles to the long axis. Spores may be produced or may not. They may have flagella, or may not.

(a) **Bacterium.** Neumann—Have no endospores. Migula—no flagella.

(b) **Bacillus.** Neumann—Have endospores, and often grow in long threads. Migula—Flagella present at any part of cell.

(c) **Pseudomonas.** Have endospores very rarely. Flagella only at ends.

III. **SPIRILLACEÆ.**—**Spiral bacteria.** Unicellular, more or less elongated. Twisted more or less like a corkscrew. Cells are sometimes united in short chains. Generally very motile. Spores are known in two varieties only.

(a) **Spirosoma** rigidly bent. No flagella.

(b) **Vibrio** or **Microspira.** Cells that are rigidly bent like a comma, and have always one, occasionally two polar flagella.

(c) **Spirillum.** Are long and spiral, like a corkscrew, are rigid, and have a bunch of polar flagella.