SOME OBSERVATION ON THE BIOLOGY OF THE CHOLERA SPIRILLUM; DEPARTMENT OF THE INTERIOR BUREAU OF GOVERNMENT LABORATORIES, BIOLOGICAL LABORATORY; NO. 19, - OCTOBER, 1904

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649281343

Some Observation on the Biology of the Cholera Spirillum; Department of the Interior Bureau of Government Laboratories, Biological laboratory; No. 19, - October, 1904 by Various

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

www.triestepublishing.com

VARIOUS

SOME OBSERVATION ON THE BIOLOGY OF THE CHOLERA SPIRILLUM; DEPARTMENT OF THE INTERIOR BUREAU OF GOVERNMENT LABORATORIES, BIOLOGICAL LABORATORY; NO. 19, - OCTOBER, 1904

Trieste

PREVIOUS PUBLICATIONS OF THE BUREAU OF GOVERNMENT LABORATORIES.

No. 1, 1902, Biological Laboratory.—Preliminary Report of the Appearance in the Philippine Islands of a Disease Clinically Resembling Glanders. By R. P. Strong, M. D.

No. 2, 1902, Chemical Laboratory.—The Preparation of Benzoyl-Acetyl Peroxide and Its Use as an Intestinal Antiseptic in Cholera and Dysentery. Preliminary Notes. By Paul C. Freer, M. D., Ph. D.

No. 3, 1903, Biological Laboratory.—A Preliminary Report on Trypanosomiasis of Horses in the Philippine Islands. By W. E. Musgrave, M. D., Acting Director Biological Laboratory, and Norman E. Williamson, Assistant Bacteriologist Bureau of Government Laboratories.

No. 4, 1903, Serum Laboratory.—Preliminary Report on the Study of Rinderpest of Cattle and Carabaos in the Philippine Islands. By James W. Jobling, M. D., Director of the Serum Laboratory.

No. 5, 1903, Biological Laboratory.—Trypanosoma and Trypanosomiasis, with Special Reference to Surra in the Philippine Islands. By W. E. Musgrave, M. D., Acting Director Biological Laboratory, and Moses T. Clegg, Assistant Bacteriologist Biological Laboratory.

No. 6, 1903.—I. New or Noteworthy Philippine Plants; II. The American Element in the Philippine Flora. By Elmer D. Merrill, Botanist. (Issued January 20, 1904.)

No. 7, 1903, Chemical Laboratory.—The Gutta Percha and Rubber of the Philippine Islands. By Penoyer L. Sherman, jr., Ph. D., Chemist, Chemical Laboratory.

No. 8, 1903.—A Dictionary of the Plant Names of the Philippine Islands. By Elmer D. Merrill, Botanist.

No 9, 1903, Biological Laboratory.—A Report on Hemorrhagic Septicæmia in Animals in the Philippine Islands. By Paul G. Woolley, M. D., and J. W. Jobling, M. D.

No. 10, 1903, Biological Laboratory.—Two Cases of a Peculiar Form of Hand Infection (Due to an Organism Resembling the Koch-Weeks Bacillus). By John R. McDill, M. D., and Wm. B. Wherry, M. D.

No. 11, 1903, Biological Laboratory.—Entomological Division, Bulletin No. 1, Preliminary Bulletin on Insects of the Cacao. (Prepared Especially for the Benefit of Farmers.) By Charles S. Banks, Entomologist Bureau Government Laboratories.

No. 12, 1903, Biological Laboratory.—Report on Some Pulmonary Lesions Produced by the Bacillus of Hemorrhagic Septicæmia of Carabaos. By Paul G. Woolley, M. D.

No. 13, 1904, Biological Laboratory.—A Fatal Infection by a Hitherto Undescribed Chromogenic Bacterium: Bacillus aureus fœtidus. By Maximilian Herzog, M. D.

No. 14, 1904, Serum Laboratory.—Texas Fever in the Philippine Islands and the Far East. By J. W. Jobling, M. D., and Paul G. Woolley, M. D.

No. 15, 1904, Biological and Serum Laboratories.—Report on Bacillus Violaceus Manilæ: A Pathogenic Microörganism. By Paul G. Woolley, M. D.

No. 16, 1905, Biological Laboratory.—Protective Inoculation Against Asiatic Cholera: An Experimental Study. By Richard P. Strong, M. D.

No. 17, 1904.—New or Noteworthy Philippine plants, by Elmer D. Merrill, Botanist.

No. 18, 1904, Biological Laboratory.—Part I. Amebas: Their Cultivation and Etiologic Significance, by W. E. Musgrave, M. D., and Moses T. Clegg. Part II. Treatment of Uncomplicated Intestinal Amebiasis (Amebic Dysentery) in the Tropics, by W. E. Musgrave, M. D.

Publications of the Bureau are given out in serial number pertaining to the entire Bureau. Publications which may be desired can be obtained by applying to the Librarian of the Bureau of Government Laboratories, Manila, P. I., or to the Superintendent of Government Laboratories, Manila, P. I.

No. 19.—OCTOBER, 1904

DEPARTMENT OF THE INTERIOR
BUREAU OF GOVERNMENT LABORATORIES
BIOLOGICAL LABORATORY

SOME OBSERVATIONS ON THE BIOLOGY OF THE CHOLERA SPIRILLUM

BY

WM. B. WHERRY, M. D.

MANILA
BUREAU OF PUBLIC PRINTING
1905

22079

LETTERS OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
BUREAU OF GOVERNMENT LABORATORIES,
OFFICE OF THE SUPERINTENDENT OF LABORATORIES,
Manila, September 20, 1904.

SIR: I have the honor to transmit herewith a paper by Dr. Wm. B. Wherry of the Biological Laboratory on "Some Observations on the Biology of the Cholera Spirillum."

I am, very respectfully,

PAUL C. FREER,
Superintendent Government Laboratories.

HON. DEAN C. WORCESTER,
Secretary of the Interior, Manila, P. I.

DEPARTMENT OF THE INTERIOR,
BUREAU OF GOVERNMENT LABORATORIES,
BIOLOGICAL LABORATORY, OFFICE OF THE DIRECTOR,
Manila, August 31, 1904.

SIR: I have the honor to transmit herewith and recommend for publication "Some Observations on the Biology of the Cholera Spirillum," by Wm. B. Wherry, M. D., Bacteriologist Biological Laboratory.

Very respectfully,

RICHARD P. STRONG,
Director Biological Laboratory.

DR. PAUL C. FREER,
Superintendent Government Laboratories, Manila, P. I.

SOME OBSERVATIONS ON THE BIOLOGY OF THE CHOLERA SPIRILLUM.

By Wm. B. Wherry, M. D., *Bacteriologist, Biological Laboratory.*

INTRODUCTION.

The following observations were made during the past year while I was engaged in some studies preliminary to and in connection with the subject of toxin production.

Such marked variations in the morphology and biochemical characters of the cholera spirillum occurred during some earlier work that it was deemed advisable to adopt a modification of the methods of standardizing culture media, published as the "Procedures," etc., by the Committee of American Bacteriologists.[1]

It is to be regretted, from a purely descriptive standpoint, that the organisms were not grown upon media prepared exactly according to the recommendations of the American Committee; but, since the main issue concerned the factors influencing toxin production, and since it was impossible to carry on two entirely separate sets of observations, a slight modification of these recommendations was employed for reasons which are given below.

Notwithstanding the use of these methods, a comparison of the biochemical peculiarities of the cultures chosen for this study reveals many points of difference between them—such as the production of a pellicle on bouillon by one, while another gives a diffuse cloudiness, the presence or absence of the cholera-red reaction, variations in the growth on potato, or in the type of the liquefaction of gelatin, etc. Many of these points of difference are

[1] *The Reports and Papers of the American Public Health Association*, 1898, XXIII, p. 60; or, for a brief summary of this report, *vide* L. Grimbert, on the Diagnosis of Bacteria by their Biochemical Functions, *Arch. d. Parasitologie*, 1903, VII, p. 304.

still emphasized in bacteriological literature, especially in the descriptions of single species. A careful preliminary study of one of these cholera cultures ("579") revealed such a wide variation in its morphology and in some of the details of its cultural characteristics, that I was forced to the conclusion that they could not be seriously considered in species description—since they are variations which will occur at intervals in the same culture.

It is hoped that this study, which was carried out under more uniform conditions than can be attained by older methods, will emphasize the variability of some bacteria and in a measure further the investigation of those factors entering into the production of such variations.

I have decided to present the subject-matter in the following order:

I. A description of the method of preparing and neutralizing the media.
II. The source, isolation, biochemical peculiarities, and varations of culture "579," with special reference to—
  (*a*) The demonstration of the cholera-red reaction.
  (*b*) The liquefaction of gelatin.
  (*c*) The optimum reaction.
  (*d*) The production of alkali.
III. A description of the source and isolation of five other cholera cultures and of their resemblance to one another, and to culture "579."
IV. Their growth in the presence of carbohydrates.
V. Their relationship as shown by agglutinating and bactericidal sera.
VI. Their pathogenicity.
VII. Their morphology and pleomorphism.
VIII. Summary and conclusions.

During this comparative study of a number of cultures from different sources, every precaution was taken to avoid contaminating one strain with portions from another culture, and the purity of each was controlled by frequent microscopical examinations and plating in gelatin or agar.

I. A DESCRIPTION OF THE METHOD OF PREPARING THE MEDIA.

One of the chief modifications of the methods recommended in the "Procedures" concerns the way in which the media was neutralized and the desired reaction obtained. The recommended method consists, briefly, in titrating a portion of the medium, as near the