

# **THE BACTERIA**

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The Bacteria by Antoine Magnin

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**ANTOINE MAGNIN**

# **THE BACTERIA**



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BY

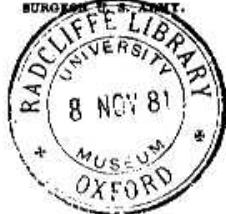
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1880.

## PREFACE BY TRANSLATOR.

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HAVING found the admirable *résumé* of our knowledge of the bacteria, by Dr. Magnin, of great assistance to me, in pursuing the investigations in which I have been engaged during the past year under the auspices of the National Board of Health, it has seemed to me that a translation of the work into English and its publication in this country would be productive of good in more ways than one, and of the advancement of science. To the naturalist, it cannot fail to be of value, as the most approved classification, that of Cohn, is given, with a full description of species. To give additional value to this portion of the work, figures of many of the best-known forms, drawn from various foreign sources, and reproductions of some of my own photo-micrographs (by permission of the National Board of Health), have been introduced.

If we are to judge from the scanty literature of the subject in this country, the amount of interest which has been aroused by the revelation of a new world of micro-organisms, and by the momentous questions which have been raised in connection with them, is far below that awakened in Germany, France, and England. This is not, however, really the case; for, while we have but few active workers in the difficult fields of inquiry

which have proved so attractive, especially for the German and the French *savants*, there is nevertheless a wide-spread interest in these investigations, and a desire to know their results. But, just here, we are met with a difficulty which has no doubt discouraged many, and perhaps caused some to drop the whole subject in disgust. The results have been so contradictory, and so many would-be *savants* have uttered opinions entirely opposed the one to the other, that we find it impossible to arrive at any definite opinion, not knowing whom to believe. This being the condition of affairs, it seems to me that it is necessary for us to commence investigating for ourselves, — first making ourselves familiar with what has been done abroad, and then avoiding, if possible, the quicksands into which unfortunate science has too often been dragged by her votaries. One great trouble which we have experienced in this country is in judging of the comparative value of the observations of different men who are equally unknown to us. A very plausible article may be written by a very careless observer; or a very cautious observer may fail to give confidence in his results, because of a certain degree of confusion in his language. When experiments are well devised, carefully executed, and described with precision, as is done by such men as Pasteur and Tyndall, we cannot fail to attach great weight to the conclusions reached. And when so accomplished a microscopist as Cohn or Koch asserts that he has seen such and such a thing, or has made such and such measurements, we cannot doubt the reliability of the observation. But sometimes we are deceived by giving credence to a man who has achieved reputation in one line of study, but of

whose skill and training in the use of the microscope we have no means of judging. Such a man may be a great surgeon, or a great clinician, or a great chemist, and yet be a mere tyro with the microscope. When, then, we see it announced that Dr. So-and-so failed to discover any *micrococci* in pus, in blood, or what not, taken from a certain source, we are justified in asking, — first, what power did the learned doctor use? second, is he capable of distinguishing micrococci in fluids which contain them beyond question? Or, if he does discover them, we may ask if he is accustomed to making a differential diagnosis between micrococci and inorganic granular material, or unorganized granules of organic origin. This is a decision which the most accomplished microscopist is sometimes unable to make, except by the aid of chemical tests and culture experiments.

To avoid this want of confidence in results, which has naturally grown out of carelessly made observations and contradictory statements, it is desirable that full and minute details should be given of all observations and experiments made, and, whenever possible, that photomicrographs should be made of all micro-organisms described, or of a thin stratum of a liquid asserted not to contain any; as, when a sufficiently high power is used, this settles the question of their presence or absence, beyond dispute, and enables other students to make comparisons and measurements which cannot fail to promote the interests of true science.

The National Board of Health of the United States has the credit of first adopting this method of recording the results of scientific investigation, in this direction, as a constant and unimpeachable record of what has



been seen by the investigator. The commission sent to Havana last summer for the investigation of yellow-fever, was instructed to pursue this method, and was accompanied by a photographer and supplied with all the necessary appliances for carrying these instructions into effect.

The superficial reader may find much to criticise in the work of Dr. Magnin, but I am convinced that those who read it carefully cannot fail to be pleased with the truly scientific spirit in which it is written; the fairness with which conflicting opinions are stated; the caution manifested as to the drawing of definite conclusions where questions are still under discussion; and, above all, the extent of his literary researches and the systematic way in which he has arranged the results.

For the naturalist, for the physician, or for the non-professional man of general culture, who desires to have accessible in a condensed form the most important results achieved in this line of inquiry up to the present day, this volume cannot fail to be of value; while for the student and the investigator in search of fuller information, the summary given of the labors of numerous individuals, together with the copious bibliography, which I have brought up to date, will doubtless be of service. Believing this to be true, it has been a pleasure for me to devote a portion of my summer vacation to the translation of this little volume.

G. M. S.

SALEM, MASS., August 1, 1880.

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## PART SECOND.

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