

*of the Author.*

EARLY DIAGNOSIS  
IN WHOOPING-COUGH.

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BY


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(University of California).

REPRINTED FROM THE

New York Medical Journal

for October 8, 1898.



WC W 133 e 1898

Z-139561

Akc. zI. 2024 nr. 66

## EARLY DIAGNOSIS IN WHOOPING-COUGH.\*

By HENRY LEWIS WAGNER, M. D., PH. D.,  
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AN early diagnosis in whooping-cough is important, as we can in many cases shorten the duration and prevent its spreading by using early proper prophylactic measures. This is not only of interest for the general practitioner, but especially for the rhinologist, who may be consulted first for the obstinate rhinitis acutissima serosa, or later for the incessant cough; and for the ophthalmologist, for the concomitant conjunctivitis hyperæsthetica.

The diagnosis can be made at once by a *bacteriological examination of the nasal secretions* ("primary place of infection"). The secretions of the *normal* mucous membranes of the nose contain very few bacteria, while in *whooping-cough* we find a large mass of bacteria of one kind—a natural pure culture of "polbacteria" (Czaplewski and Hensel). This bacterium, when full grown, is two to three times as long as broad, is rounded and somewhat thickened at its ends, and is divided in the

\* Read before the American Laryngological Association at its twentieth annual congress.



middle. Nearly all of them are surrounded by a more or less pronounced capsule, not unlike the Friedlaender's pneumococcus. This capsule originates in the animal body by imbibition of the external layers of the cell membrane (by plasmolysis), and is lost by artificial cultivation (perhaps by peptonization). The morphological properties of this pertussis bacterium have been studied by several authors with varying results, as they have had to encounter the difficulties of not only isolating this one bacterium from a large number of others, which are found in the secretion of the pharynx and lower respiratory organs, but also in observing somewhat different forms of this (whooping-cough) bacterium when using different methods of staining.

This may be due to chemical reactions of the protoplasm of the capsule which surrounds this bacterium.

The Czaplewski method of staining this bacterium consists (a) in the action of one-per-cent. acetic acid solution, (b) by staining with a heated ten-per-cent. carbolic-acid-glycerin-fuchsine solution.

This latter solution consists of one part of fuchsine, five parts of liquefied carbolic acid, fifty parts of glycerin, and a hundred parts of water.

Formerly other investigators and I used the plain aniline colors, which failed to give such a true picture.

Of late I am using, with excellent results, the Knaak's contrast stain, which I have somewhat modified, enabling me to examine quickly the entire field. The bacteria are stained blue and the cells and their nuclei red.

This method consists in staining with methylene blue in a weak alkaline solution. This stain is then de-

colorized by two-per-cent. freshly prepared argonin solution, which reduces the methylene blue in the cells and their nuclei quicker than in the bacteria. To prevent a reoxidation of the leukomethylene blue by atmospheric oxygen, we wash off the specimen with a concentrated solution of cream of tartar. As contrast stain we can use a very diluted fuchsine solution (one part concentrated alcoholic solution to forty parts of water).

In the case of Czaplewski, who was taken ill with whooping-cough during the study of the disease, the examination of his nasal and pharyngeal secretions showed the same bacterium as he was studying, verifying this bacterium as the cause of the disease.

The treatment should certainly be principally a local one, which Michael long ago advocated, and which has lately been revived by Moizart.

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