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### THE PATHOLOGY OF DIPHTHERIA, STATUS PRÆSENS\*

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The title of this paper as it has been given me for the purpose of introducing this discussion, intimates that I am to present you with recent facts bearing on the morbid phenomena diphtheria. But it also suggests (and, I think, very properly) that the pathological status is still somewhat uncertain.

In this country, pathology is commonly understood to embrace both pathological anatomy and pathogenesis; the latter includes also the causation of disease. These are all broad subjects. Fortunately, the pathological anatomy of diphtheria affords us little ground for difference of opinion. It has been well studied; and the matter was practically closed some years ago.

But the pathogeny of diphtheria, and with it, as I have said, the etiology (for they cannot be disassociated) are still under active discussion, though the work of the last few years in Berlin, Paris, New York and Baltimore, has cleared up a number of doubtful points. And the importance of understanding the pathogeny is very great, for if diphtheria is shown to be a contagious disease, propagated by a peculiar bacterium that can be readily recognized and distinguished by the microscope, then we have made a great stride in diagnosis, and can inaugurate both preventive and curative methods in a way that has heretofore been impossible.

I may here premise that the preponderating evidence at hand is to the effect that bacillus known as Lœffler bacillus is the cause of *true, genuine* or *primary* diphtheria; but that there is also a *false* diphtheria which may be called *diphtheroid*, in

which the diseased tissues have a bacillus similar in appearance, though without pathogenetic qualities; that diphtheria is a contagious disease (almost wholly so from a bacteriological point of view); that the Lœffler bacilli retain their virulence in a remarkable manner, but they also genenerate a soluble material that has similarly virulent properties; while finally another soluble substance known as an *anti-toxine* can be extracted from the blood of convalescents and immune animals, which may be regarded not only as a protective, but also as a curative agent.

So far as the pathological anatomy of diphtheria is concerned, its main features will now be briefly summarized. The disease is characterized by the formation of a membrane in the upper air passages, the throat, larynx and bronchi, the posterior nares, and sometimes the anterior nares; while any mucous surface in the body can also be attacked, or even the skin, if it has been abraded, as in the case of a sore nipple, or burn. But the mere presence of a membrane does not indicate diphtheria, and even a pathologically diphtheritic inflammation may attack a mucous surface, the conjunctiva, for example, though the patient have no diphtheria. In this connection, it will avoid some misunderstanding if I say that our German friends use the word *diphtheritic* to indicate that an exudation or membrane is attached more or less deeply to the tissues, while, on the other hand, they use the word *croupous* to indicate that it rests on the surface, from which it may be separated without affecting the integrity of the underlying parts. These, therefore, are *conventional* terms, but have long been in use on the other side of the water, where, I presume, they will continue to be used for some time to come.

But while the membrane is a characteristic of diphtheria, it is not an essential characteristic, and the exudation on the surface may be catarrhal or serous; or gangrene may replace the membrane. An interesting illustration of this point has recently been given by Concetti†, where an infant was found to have diphtheria bacilli in the mucous of the pharynx, though a membrane was not found until eight days later; and he has on several occasions found these bacilli in slight cases of

\*Read before the N. Y. State Medical Society, Feb. 6, 1893.

\*My friend, Dr. Theobald Smith, reminds me that there are diphtheritic exudations in hog cholera.

†Concetti, *Centralblatt. f. Bakteriolog.*, 19, 1893, p. 629.