

between the hydrogen ion concentration of the feces and the bacterial flora. That is to say, the hydrogen ion concentration limits remained essentially the same during the preliminary and the transforming periods of the different experiments.

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An unrecognized pathway for bacterial invasion of the respiratory tract.

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Normally, the ciliated, mucus-secreting epithelium is a mechanism competent to protect the lungs against infection by way of the upper respiratory tract. When this epithelium is injured by toxic gas or when the mechanism is otherwise incapacitated, as for example, in aspiration pneumonia, the lumen of the trachea undoubtedly is the pathway traveled by the agent responsible for the pulmonary inflammation. Pneumonia may occur, however, and this is especially true of the lobar type, without demonstrable gross lesion of the upper respiratory tract, and in these circumstances some route other than the above must have been provided.

Experimentally, the introduction of pneumococci by intratracheal instillation or by needle puncture of the tracheal wall through the neck, may result in pneumonia. With either of these methods of inoculation, local damage to the mucosa of the trachea occurs. When the needle method is employed, an opportunity is at hand, not only for infection of the submucosa, but of the peritracheal tissue as well. When the organisms are introduced by insufflation into the rabbit, damage to the mucosa of the larynx or upper trachea can hardly be avoided. In either case, an atrium of invasion for the submucosa of the trachea is provided, and histologically infection of the submucosa is evident at the point of inoculation. From here it may be traced throughout the submucosa of the trachea and larger bronchi to the hilum of the

lung by way of the peribronchial and periarteriolar structures into the pulmonary tissue. Infection of the lung occurs under these conditions even though cultures from the lower trachea are sterile.

An abundant lymphatic system can be demonstrated by the injection of India ink into the submucosa of the trachea. This plexus extends from the epiglottis downward as far as the bifurcation of the trachea and connects directly with similar plexi in the submucosa of each bronchus. With further subdivisions of the bronchi, the condition noted above is duplicated. At the points of bifurcation throughout the cartilage-bearing bronchi, anastomotic branches connect the plexi with the periarteriolar lymphatics, and other branches pass directly to the regional lymph glands. Thus a short circuit around the valves of the deeper pulmonary lymphatics is provided.

The distribution and extension of these tracheal lymphatics can be demonstrated equally well by Gram-stained sections prepared from an animal inoculated through the submucosa of the trachea by injection or insufflation of virulent pneumococci. The presence of the organisms shows the distribution of the infection through the lymphatics of the submucosa of the trachea, past the hilum of the lung, into the pulmonary parenchyma. Thus a direct pathway of infection is provided. On the other hand, the manner in which the lymphatic plexi are sharply demarcated at the bifurcations of the trachea and bronchi suggests that this lymphatic system may also serve as a protective mechanism, since, undoubtedly, many of the invading bacteria are, at these points, diverted to the protective regional lymph glands.

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The life of the white mouse.

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White mice may give birth to young every month in the year, but most of the litters come during the warmer months. Males