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## Rôle of Respiratory Obstruction in "Neuropathic" Pulmonary Edema Following Vagotomy.

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Reports by Weiser[1] and Farber[2] have suggested that pulmonary congestion and edema, fatal within a period of hours, are specific consequences of bilateral vagotomy in the rat, guinea pig, and rabbit. In the larger common laboratory animals (cat and dog) this is not the case.[3, 4, 5] This study was undertaken in an effort to determine the basis for this difference.

Doubly vagotomized rats and guinea pigs in which tracheotomy was first done were kept alive many hours longer than the longest survivals reported,[1, 2] without evidence of pulmonary edema. Tracheotomy consisted of a simple transverse slit, handling of the trachea being avoided. The animals were fixed on their backs throughout the procedure to permit care of the wound. Cannulation, which would have circumvented this, was found unsatisfactory because of the difficulty in maintaining a free air-way. In spite of all precautions, tracheal secretions produced respiratory obstruction in a number of animals. Death with pulmonary congestion and edema followed shortly if effective steps were not taken to clear the air-way.

In a number of rats and guinea pigs, and in one rabbit, the right vagus was cut below the recurrent laryngeal nerve, the left being severed in the neck a number of days later. In the rat, paralysis of one vocal cord caused an obvious obstruction, the animal dying within thirty hours, many times the survival period observed in bilaterally vagotomized rats with both vocal cords immobilized. The lungs exhibited varying degrees of congestion and edema, as well as extensive pneumonic consolidation. Survival in the guinea pigs ranged from one to 22 days. Laryngeal obstruction was apparent in the short survivals. The lungs were similar to those in the rat. Obstructive symptoms were minimal in the longer survivals. These were terminated by pneumonia. The rabbit lived 10 days, the lungs at death showing pneumonic consolidation.

1 Weiser, J., *Pflüger's Arch.*, 1932, **231**, 68.

2 Farber, S., *J. Exp. Med.*, 1937, **66**, 397, 405.

3 Schafer, E. S., *Quart. J. Exp. Physiol.*, 1919-20, **12**, 231, 367.

4 Boothby, W. M., and Shamoff, V. N., *Am. J. Physiol.*, 1915, **37**, 418.

5 Pavlov, I. P., *The Work of the Digestive Glands*, 2nd Ed., London, 1910.

It was concluded that respiratory obstruction was primarily responsible for the lung changes observed, and that the reaction of smaller animals to bilateral vagotomy, in this particular respect, differed in no way from that of the larger animals, but that it was less readily demonstrated because of a smaller airway which easily became occluded.

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## *In vitro* Studies on the Action of Sulfapyridine.

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The use of sulfapyridine (2-sulfanilyl aminopyridine) in experimental pneumococcus pneumonia,[1] together with favorable clinical reports in the treatment of lobar pneumonia, led Fleming[2] to conduct *in vitro* studies on the action of the drug on the pneumococcus. He observed a marked bacteriostatic effect in deleukocyted blood, using his "slide-cell" technic. His criterion of bacteriostasis was the relative colony size of drug-treated cultures as compared with untreated controls. Whitby[1] reports a degeneration and final disappearance of the capsule in the peritoneum after 4 hours' growth in drug-treated mice. Fleming[3] has not been able to confirm this in his *in vitro* work.

The present studies were made to obtain data regarding the growth curve of the pneumococcus under the influence of the drug, which would give a quantitative measurement of bacteriostasis. In addition, morphological studies were made at regular intervals during the growth curve.

The organism used was a Type II pneumococcus which had been carried in mice for over a year by the method of Neufeld and Handel.[4] Eight-hour cultures, made by adding a drop of heart's blood from a freshly dead mouse to 20 cc of veal infusion broth, were used in all experiments. A culture of this age was chosen to prevent the appearance of a lag phase, which would result in exposure of resting

1 Whitby, L. E. H., *Lancet*, 1938, **1**, 1210.

2 Fleming, A., *Lancet*, 1938, **2**, 74.

3 Fleming, A., *Lancet*, 1938, **2**, 564.

4 Neufeld, F., and Handel, L., *Berl. Klin. Woch.*, 1912, **49**, 680.