

## 7109 P

## Direction of Flow of Nasal Mucus.

ALFRED M. LUCAS\* AND L. C. DOUGLAS. (Introduced by E. V. Cowdry.)

*From the Department of Anatomy, Washington University Medical School,  
St. Louis.*

Information concerning patterns of ciliary movement in the nose of man and monkey is already available, but in order to learn the significance of the direction of mucous flow in various regions of the nose and its possible relation to physiological and anatomical factors, experiments were performed on numerous mammals, selected to include a wide range in size, the mouse, rat, rabbit, opossum, cat, sheep and cow.† The animals were decapitated and the lateral nasal wall exposed by cutting near the median line. Two methods were employed which doubly insured accuracy; one, the application of carbon particles to the mucous surface, is well known; and the second, which leaves the mucous layer undisturbed and permits the moving cilia themselves to be observed *in situ*, has recently been described.<sup>1</sup>

It was found, as a result of these experiments, that the mucous flow in the upper half to two-thirds of the lateral nasal wall including the middle meatus, is toward the anterior end of the nose in all the animals mentioned. Only the material collected from the ethmoid conchae and those regions adjacent to the floor arrives in the nasopharynx. The material derived from the ostium of the maxillary sinus spreads, fan-like, to be distributed toward the anterior end, the floor, and the nasopharynx.

Evidently the direction of ciliary beat is adapted to protect the non-vibratile olfactory epithelium from accumulation of mucus along its border. This should be taken into account when fluids, bacterial suspensions, and viruses are experimentally introduced into the nose with the expectation that they will pass through the cribriform plate as a portal of entry into the central nervous system.

The entire mucous sheet in man and monkey ultimately reaches the nasopharynx and none passes out of the anterior nares, which is

---

\* Aided by grants from the National Research Council and the Chemical Foundation and an appropriation from a grant from the Rockefeller Foundation to Washington University for research in science.

† We are indebted to the Independent Packing Company of St. Louis for the material and space to study the noses of freshly killed sheep and cows.

<sup>1</sup> Lucas, A. M., *Arch. Otolaryngol.*, 1933, **18**, 516.

quite different from the condition found in the animals described and in the latter the region of greatest ciliary activity is in the upper part of the nose and the flow of mucus in the lower half and along the floor is very sluggish. This also is exactly opposite to the condition found in man and monkey.

The direction of air currents was then determined for the cat by plotting out the distribution of inhaled carbon and it was found that it differed to an equal degree from the plan of air currents as marked out in man by Paulsen.<sup>2</sup> Therefore it was concluded that the direction of air currents through the mammalian nose is a factor in the development of the pattern of mucous flow and that the two are inversely correlated.

## 7110 P

### Histology of the Ovary of Hypophysectomized Rats Treated with Urinary Hebin.

NELSON J. WADE. (Introduced by W. D. Collier.)

*From the Department of Biology, St. Louis University.*

The treatment of hypophysectomized rats with hebin, the gonad stimulating substance from human pregnancy urine, indicates that the response is conditioned by the time intervening between hypophysectomy and the beginning of hebin administration and by the influence of hebin administration, immediately after hypophysectomy, upon a later treatment with hebin, after an intervening period of rest.

Female albino rats, weighing about 120 gm. when completely hypophysectomized by Dr. Smith's method,\* showed the usual ovarian changes with atresia of follicles, almost complete absence of follicular development, granulosa atrophy, interstitial tissue hyperplasia and production of wheel cells described by Selye *et al.*<sup>1</sup>

In all cases one ovary, removed at some crucial period in the experiment, was compared histologically with the second ovary, removed at the end of the experiment.

---

<sup>2</sup> Paulsen, E., *Sitz. d. k. Akad. d. Wiss., Wien., Math-naturen*, 1882, **85**, 352.

\* The writer wishes to express his gratitude to Dr. Smith for explaining some of the details of the operation and to Dr. H. B. Van Dyke for demonstrating the operation.

<sup>1</sup> Selye, H., Collip, J. B., and Thomson, D. L., *Endocrinology*, 1933, **17**, 494.