is given by J. W. Mellor [*Comprehensive Treatise on Inorganic and Theoretical Chemistry*, vol. III, p. 276]. A product closely similar in chemical composition, particle characteristics, and optical properties was made in this laboratory simply by grinding in a mortar copper acetate with a saturated solution of sodium carbonate, filtering, washing, and drying. A fuller account is in preparation.

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Response of Nasal Epithelium to Odor Stimulation

An *in vitro* preparation of nasal epithelium has been developed in order to study its response to odors in a most direct manner. (This work was supported by a grant from the Armour Research Foundation and by the Research Council of Florida State University.) The opossum contains a large yellow olfactory area. A 2-cm² sheet of this tissue was carefully removed and placed in a flat lucite chamber that allowed one to dissect, under high magnification, the nerves from the richly innervated epithelium. The underside was supported by lucite except for a 1-cm² surface that could be exposed to either purified room air or one of a number of different odors.

Recordings were made from very small branches of nerves. Mechanical stimulation of the tissue resulted in very large spikes, whereas only small spikes were recorded in response to odors. These small nerves conducted spikes at about 0.4 m/sec to 1.0 m/sec. Single fibers were rarely seen to respond at a frequency greater than 8 to 15 per second.

Odors were obtained by allowing an air stream to pass over the surface of 5 ml of odorous liquid contained in a 50-ml erlenmeyer flask at the rate of 30 ml/min. A portion of this stream was allowed to diffuse into the air 1 cm below the surface of the epithelium.

Most preparations that contained a number of active fibers showed resting activity. Odors such a amyl acetate, benzene, cajeput, eucalyptus, leaf cloves, spruce, Florida orange, asafetida, 2-furaldehyde, and freshly ground coffee beans stimulated a number of such preparations, and the nerve activity increased markedly.

The percentage increase in the number of spikes per second above resting activity of a given preparation as various odors were presented for 30 sec is as follows: amyl acetate, 110; cajeput, 42; spruce, 27; Florida orange, 21; leaf cloves, 0; musk xylol, 0. A 5-min rest in purified air was given after each odor stimulation. High concentrations of amyl acetate may have a detrimental effect.

A nerve bundle containing only a few active fibers reveals that one fiber may not respond to a given odor as well as another fiber, although this relationship may be reversed if a different odor is chosen. Figure 1 shows the response of a few-fiber preparation to various odors. Note that the same fibers do not respond to all the odors.

The nasal epithelium in the olfactory region is innervated by both olfactory and trigeminal nerve fibers. The type of stimuli to which the preparation responds and the slow conduction velocity of the nerves suggest that the recordings are from olfactory nerves. On the other hand, some nerve twigs contain a few large fibers that respond to mechanical stimulation, which suggests that trigeminal nerves may be involved. For these reasons, a live-rabbit preparation was devised so that the responses to odors could be recorded from the olfactory nerves as they passed through the cribriform plate (Fig. 2). Such results were compared with those recorded from known trigeminal nerves of the same rabbit. Both of these nerves responded to most of the stimuli chosen. Therefore, the olfactory and trigeminal systems are much more similar in the type of stimuli to which they respond than was previously realized.

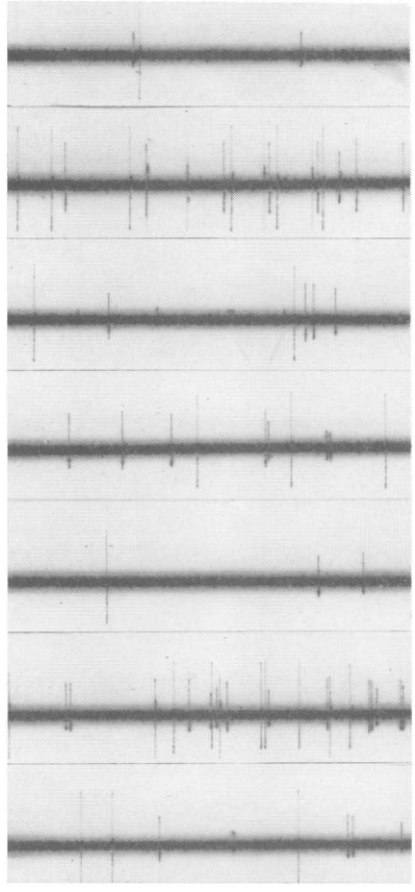

Fig. 1. The response of a few-fiber preparation to various odors. Several minutes elapse between each record. Top to bottom: air, 2-furaldehyde, air, heptane, air, coffee, air. One-half-inch horizontal space represents 1 sec.

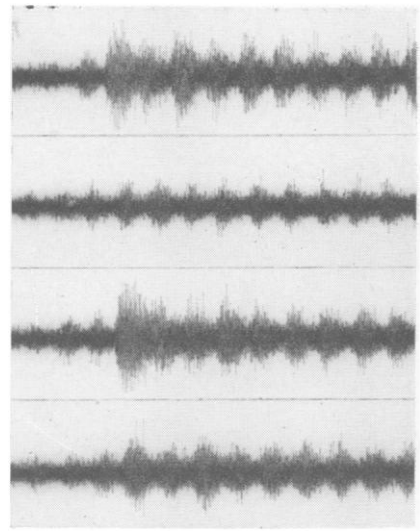

Fig. 2. Response of olfactory nerve twig to odors inhaled during breathing under anesthesia. Top to bottom: amyl acetate, benzyl benzoate, *n*-heptaldehyde, eucalyptus. One-half-inch horizontal space represents 1 sec.

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Manometer Flask for Measuring Respiratory Quotients

Although the methods presently available for measuring respiratory quotients (RQ) provide insight into patterns of metabolic changes, they leave much to be desired, both in ease of manipulation and validity of the results (*1, 2*). With these methods the measurement of changes in the RQ over extended and varying periods of time on the same tissue sample is usually impossible (*3*).

The techniques that permit the measurement of RQ rates at different or continuous intervals, such as those described by Laser and Rothschild (*4*), Noyons, (*5*), Prop (*6*), Asprey (*7*) Wolf *et al.* (*8*), and Gaffron (*9*), require elaborate equipment and considerable manipulation. Other manometer flask modifications that are used for RQ determinations measure the net oxygen uptake and carbon dioxide evolution over a period