FIG. 1. Effect of reserpine on the release of norepinephrine from subfractions of mitochondrial fraction of brain stem.

(The density gradient of sucrose in molar concentration is indicated at the left side of the tube).

---●--- Control 0°C
 ---○--- Control 30°C
 ---□--- Reserpine (10^{-3} M) 30°C

Since other compounds except reserpine were observed not to accelerated the spontaneous release of the accumulated norepinephrine, it was supposed that there are some different mechanisms in the catecholamine releasing actions by these different drugs. Furthermore, it should be also noted that some functionally different mechanisms are existing in the catecholamine releasing processes among various tissues.

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LOCALIZATION OF RESPIRATORY NEURONES IN BRAINSTEM OF CATS

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Received for publication November 18, 1965

The unitary discharges of respiratory neurones were recorded in the cats. Cats were immobilized with gallamine triethiodide under artificial respiration, or anesthetized with pentobarbital. Spontaneous and rhythmic unit discharges in the brainstem corresponding to the periodicity of phrenic nerve discharges were recorded (Fig. 1-C). In the lateral medullary reticular formation the ratio of inspiratory : expiratory units were approximately 3.3 : 1 under pentobarbital anesthesia. However, in curarized cats there were 1.7 : 1. In the pontine reticular formation the respiratory discharges were not detected in the case of pentobarbital anesthesia (Fig. 1-A), but in curarized and bilaterally vago-

FIG. 1. Dorsal projections of the brainstem showing distribution of respiratory units (A and B) and spontaneous activity patterns of an inspiratory, expiratory unit (1) and phrenic discharges (2) during simultaneous recordings (C).

A and B: distribution in anesthetized and curarized cats respectively. Symbols in A and B: •, an inspiratory, ×, an expiratory unit.

In C, 1: spontaneous discharges of an expiratory (a) and an inspiratory unit (b) in the anesthetized cats; 2: discharges of an expiratory unit (a), an inspiratory unit (b) and phrenic discharge (c) in the curarized cat.

tomized cats, the discharges were recorded not only in the pons but also in the medial medulla (Fig. 1-B).

The differences between the medullary and pontine unit discharges were analysed by statistical calculation of the various parameters of each discharge pattern (interval between volleys, number of spike potentials per volley, duration of volley, and frequency in volley). In the pons the phase-spanning discharges besides inspiratory and expiratory discharges were recorded more often than in the medulla. In general the discharges detected in the pons were more varied than in the medulla, according to the experimental conditions. The inspiratory unit discharge in the lateral medullary reticular formation was simultaneously recorded with a discharge of the inspiratory or expiratory units in the pons. During these recordings the brainstem was transected between the medulla and the pons. After the transection all discharges observed in the pons became silent, although the discharges in the medulla remained. These results indicate that the unit activities in the pons are dependent on the activity of medullary unit discharge.