TABLE I.
Average Percentage Increase in Blood Pressure Following Submucosal Injections.

Solution	Vol. of injections	No. of animals	Avg % increase in blood pressure		
			Ant. palatine	Mental	Post. palatine
Procaine 2% with epinephrine 1:25,000	2.0 cc	19	43.1	21.9	11.6
$Ca_3(PO_4)_2$ epinephrine 1:25,000	2.0 "	19	11.5	11.4	4.0

rine mixtures showed that the supernatant fluid contained epinephrine at as great a concentration as did the original solution.

Conclusions. It is quite apparent that colloidal $Ca_3(PO_4)_2$ diminishes the pressor effect of submucosally injected epinephrine.

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Survival of the Respiratory (Gasping) Mechanism in Young Animals Subjected to Anoxia.

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Various observers (Reiss and Haurowitz,[1] Avery and Johlin,[2] Kabat and Dennis,[3] Selle and Witten,[4] and Himwich, Alexander and Fazekas[5]) have reported that young animals are much less susceptible to anoxia and asphyxia than adults. The present studies were undertaken to determine whether the primitive respiratory mechanism (gasping) itself survives longer in the young than in the old.

Movements of the mandible of various species (dogs, cats, rabbits, and rats) were recorded mechanically following complete and rapidly induced anoxia produced by ligation of the cerebral vessels or by decapitation. In preliminary experiments it was

1 Reiss, M., and Haurowitz, F., *Klin. Wchnschr.*, 1929, **8**, 743.

2 Avery, R. C., and Johlin, J. M., PROC. SOC. EXP. BIOL. AND MED., 1932, **29**, 1184.

3 Kabat, H., and Dennis, C., PROC. SOC. EXP. BIOL. AND MED., 1939, **42**, 534.

4 Selle, W. A., and Witten, T. A., *Proc. Am. Physiol. Soc.*, 1941, **53**, 253.

5 Himwich, H. E., Alexander, F. A. D., and Fazekas, J. F., *Proc. Am. Physiol. Soc.*, 1941, **53**, 193.

found that the character and duration of the gasps induced by either of these methods were essentially the same and that the gasping movements of animals in which the cerebral vessels were ligated corresponded to and were simultaneous with labored respiratory movements of the trunk.

It is evident that the respiratory center of the young is much more tenacious and viable than is that of the adult, and that the survival of gasping itself is inversely proportional to age for animals up to or slightly past the weaning period. Thus, the isolated head of a rat 7 weeks of age or older gasps 5 to 8 times over a period of 10 to 20 seconds and remains motionless thereafter; whereas, the head of a younger animal may continue to gasp for many minutes.

Unlike adults, rats under 6 weeks of age display 2 periods of gasping movements: an initial series which consists of 6 to 12 gasps and lasts for a period of 20 to 80 seconds; and a second series which begins after an interval of 30 to 50 seconds following cessation of the initial or first series. The total number of gasps in both series, as well as the total duration of gasping, is greater the younger the animal (as is shown in the table). The second series, which is influenced most by age, lasts 20 to 40 minutes in new-born animals; as age increases, the duration of gasping, as well as the number of gasps, diminishes uniformly in this series. At about the sixth week the second series fails completely.

Gasping is apparently uninfluenced by sensory stimuli from the cut cord and other severed nerve paths, for immersion of the isolated head in 10% formalin, 5% phenol, or 95% alcohol, and cooling of the cord or other cut surfaces with ethyl chloride, do not appreciably alter the nature or duration of gasping; nor does immersion in 5% lactic acid, 5% sodium carbonate or 5% sodium citrate influence gasping.

The survival of the respiratory mechanism seems to parallel other physiological processes as it is further found that (1) pupillary responses of the isolated head, (2) trunk reflexes of the spinal animal, and (3) action of the exposed heart, are all retained longer the younger the animal.

Information is lacking concerning the essential factors responsible for the marked disparity in survival of the respiratory mechanism of young and old animals; metabolism differences, however, appear to be involved.

General anaesthetics (ether, chloroform, and nembutal) alter greatly the strength and duration of the gasps. The first series is completely blocked when surgical anaesthesia is induced prior to decapitation. The second series is also frequently blocked or short-

ened, but in very young animals delayed gasps of reduced amplitude and increased rate occasionally occur.

Morphine tends to obliterate the interval between the first and second series and to reduce slightly the frequency; however, the total duration of gasping, as well as the total number of gasps, is usually greatly increased by this drug.

In very young animals (10 days or less) having a long second series, the frequency of gasping is increased by warming the isolated head and decreased by cooling; the duration of gasping is reduced by warming, increased by cooling. The total number of gasps however, appears to be little altered by temperature unless extreme ranges are employed.

If the area over the medulla and cerebellum of an isolated head of a young animal is quickly cooled by ethyl chloride or by immersion in cold Ringer's, gasping ceases. Upon warming, gasping is resumed and a more or less normal series ensues. Heads of 1 to 4-day-old rats have been revived after more than 30 minutes of cooling.

TABLE I.
Mandibular Movements of the Isolated Heads of Rats of Various Ages.*

	Age in days							
	1	2	7	14	21	28	35	90
Gasps in Series I	12.7	13.2	12.3	8.1	7.2	6.9	6.0	5.3
Series II	40.3	30.5	24.0	19.5	9.2	4.9	2.3	0.0
Total gasps	53.0	43.7	36.3	36.3	16.4	11.8	8.3	5.3
Total duration, sec	1630	1450	745	278	117	75	56.3	14.5

*Values represent averages for 10 animals.

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Immunizing Capacity of Virus of Eastern Equine Encephalomyelitis Inactivated by Ultraviolet Light.

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The inactivating effect of ultraviolet light on viruses as well as bacteria has been observed repeatedly. That viruses so inactivated may be effective as immunizing antigens has already been shown for at least 2 viruses capable of causing disease in man. With a