by increased secondary mortality. These results indicate, therefore, that A strain parental tissues are also capable of "immunizing" F_1 hybrid mice.

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Received June 12, 1961. P.S.E.B.M., 1961, v107.

Effect of Stress on Potassium Content of Rat Brain. (26813)

F. B. BENJAMIN, JOAN N. ANASTASI AND W. M. HELVEY
Life Sciences, Republic Aviation Corp., Farmingdale, N. Y.

Previously it was shown that various types of injurious stimuli, when applied to peripheral tissues, cause a release of intracellular potassium(1), and that this release is prevented by analgesic agents(2). Adriani(3) suggests that process of excitation and inhibition in the C.N.S. may parallel those of peripheral mechanisms. A specific relationship between C.N.S. excitability and potassium (K) is indicated by the work of Ghosh and Quastel(4), Himwich(5), and Tsukeda (6). A number of workers found a low serum K during anesthesia(7,8,9). The present investigation represents an attempt to determine whether release and uptake of K by brain cells may be one aspect of the C.N.S. phase of the general stress response.

Methods. Rats were exposed to 3 different types of stress conditions: 1. (a) Anoxia was produced by evacuating a bell jar to an air pressure of 225 mm Hg. This was maintained for 120 minutes. (b) After return to ambient pressure, the animal was immediately decapitated. The brain was peeled out and washed in K-free Ringer solution. The 2 hemisections were separately macerated with fine sand, pestle and mortar. Potassium (K) content was determined from flame-photometric analysis of the watery extract and expressed as microequivalents per gram of dry tissue weight.

2. Heat stress was produced by putting a rat in a hot chamber at 42°C. The rat was maintained in the chamber until there were signs of impending collapse (air hunger). This took between 17 and 32 minutes with a

TABLE I. Effect of Stress on K Concentration of Rat Brain.

	Stimulus: 225 mm Hg	42°C	4°C	Control
	Time: 120 min.	23 min.	120 min.	
K conc.*	29.34	26.47	25.03	37.88
Significance†	.95	.99	.99	

* Microequivalents/g of dry tissue, mean of 8 tests.

† Difference experimental and control value, p value, (t test).

mean of 23 minutes. Subsequent procedures were the same as those under 1-(b).

3. Rats were kept in a refrigerator at 4°C for 120 minutes. The animals showed little effect of the cold (liveliness, eyes, fur). Subsequently, they were treated as those of the other groups 1-(b).

4. Controls were treated as under 1-(b).

Results are given in Table I. The differences between the individual stimuli are not significant. P values indicate degree of significance of the stimulus-control difference.

Conclusion. Systemic stresses of anoxia, heat and cold in rats result in a significant decrease of potassium concentration of the brain.

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Received June 29, 1961. P.S.E.B.M., 1961, v107.

Effect of Stress on Potassium Release from Surviving Rat Brain. (26814)

F. B. BENJAMIN, JOAN N. ANASTASI AND W. M. HELVEY
Life Sciences, Republic Aviation Corp., Farmingdale, N. Y.

In previous work(1) it was shown that various types of systemic stress (anoxia, heat, cold) decrease the potassium (K) concentration of the brain. This paper is an attempt to determine the importance of certain factors which may affect this potassium release.

In a first series of experiments guinea pigs were killed by a blow on the head. The brain was immediately taken out, hemisectioned and immersed in a bath of 10 ml of K-free mammalian Ringer's solution. While one half was exposed to cold (3°C) or heat (42°C) the other half was maintained at control level (23°C). Potassium release for the next 90 minutes was determined from the flame-photometric analysis of the bathing solution. Results are presented in Table I. It is assumed that the potassium loss as indicated by these data is limited to the most superficial layers of the hemisectioned brain.

Extreme heat has no significant effect on K release. Extreme cold produces a decrease of K release. As either stimulus, when applied systemically to the intact animal, results in a marked increase of K release from the brain(1), it appears that the systemic effect in the intact animal is not due to a direct temperature effect on the brain.

As another approach to this problem the following tests were performed on rats: The animal was decapitated, the brain immediately removed, hemisectioned and maintained in separate tubes containing K-free Ringer solution. Oxygen was bubbled through one test tube and nitrogen through the other.