13350 P

Survival of Infant and Adult Rats at High Altitudes.*

HERMAN C. HERRLICH, JOSEPH F. FAZEKAS AND HAROLD E. HIMWICH.

Department of Physiology and Pharmacology, Albany Medical College, Union University, Albany, N.Y.

Previous work has disclosed that the young of many species are more resistant to anoxia than are the adult animals.[1] In that investigation the oxygen of the inspired air was displaced by other gases. The present communication reports a comparative study of the effects of high altitude on the survival of adult and infant rats.

Method. The rats were placed in a large decompression chamber and the air evacuated until a pressure equivalent to that at 40,000 feet was attained, the rate of ascent being 2,000 feet per minute. The animals were observed through a window.

Results. From the table it may be seen that after an altitude of 40,000 feet is reached the adult rats succumb rapidly to the low oxygen tension, the survival period being from approximately 10 to 30 minutes. Two rats, 1½ days of age, were removed alive after 150 minutes of exposure at 40,000 feet. The 3-day-old rats survived from less thn 70 minutes to periods longer than 114 minutes. As the animal increases in age its tolerance diminishes as is indicated by the survival periods for 6-day-old rats, the survival period of these rats varying from approximately 16 to 46 minutes.

TABLE I.
Altitude and Survival.

Adult rats			Infant rats			
No. obs.	Survival in min.	Remarks	Age days	No. obs.	Survival in min.	Remarks
3	9	Succumbed	1½	2	150	Alive
2	10	"	1½	1	135	Succumbed
1	13	"	3	3	107	Alive
3	18	"	3	4	114	Succumbed
3	30	"	3	1	91	"
			3	1	80	"
			3	1	71	"
			6	4	46	"
			6	2	16	"

* Aided by a grant from the Child Neurology Research (Friedsam Foundation). We are indebted to Dr. Alvan L. Barach for the use of the decompression chamber.

1 Fazekas, J. F., Alexander, F. A. D., and Himwich, H. E., *Am. J. Physiol.*, 1941, **184**, 281.

Summary. Infant rats can tolerate a low oxygen concentration (3.87%) at high altitudes (40,000 feet) longer than adults of the same species. This tolerance decreases with age and is probably associated with the lower cerebral metabolism of infant brain.[2] The diminution of metabolic rate of adult rats by thyroidectomy increases the resistance of these animals to high altitudes.[3] The importance of the factor of aeroembolism in this differential survival has not been determined.

13351 P

Recovery of Pupillary Function in Cut Optic Nerves of Cats and Monkeys.*

O. LOWENSTEIN AND M. B. BENDER.

From the Department of Neurology, New York University Medical College, and the Laboratories of the Mount Sinai Hospital, New York.

The question of structural and functional recovery of central nervous system tissue in mammals is still a moot point. There are many experiments dealing with regeneration of the optic nerve in fish but practically none in higher forms. Sugar and Gerard[1] studied regeneration of the spinal cord in the rat and found that "true anatomical and physiological regeneration can occur in the rat spinal cord."

We studied the recovery of the pupillary light reflex after sectioning the optic nerves in 3 cats and 4 monkeys by the pupillographic method as developed by Lowenstein.[2] The recordings were made in the dark with infra-red sensitive film. The film was then projected on a screen and pupillary diameter measurements made in tenths of mm. The time intervals were in tenths and seconds.

From 16 to 17 months after the (right) optic and ciliary nerves were severed just behind the globe, direct (of the operated eye) and

[2] Himwich, H. E., Sykowski, P., and Fazekas, J. F., *Am. J. Physiol.*, 1941, **132**, 293.

[3] Barach, A. L., Eckman, M., and Molomut, N., *Am. J. Med. Sci.*, 1941, **202**, 336.

* This work has been aided by grants from the Josiah Macy, Jr., Foundation and the Rockefeller Foundation for Medical Research.

[1] Sugar, O., and Gerard, R. W., *J. Neurophysiol.*, 1940, **3**, 1.

[2] Lowenstein, Otto, *Arch. Psychiat. Nervenkr.*, 1927, **82**, 285.