

These results seem to be in agreement with those obtained by Eddy¹ on salivary secretion. The effects of high carbon dioxide resemble the results of Gesell² on the rate of flow of lymph but the resemblance does not hold for low oxygen.

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Effect of High Oxygen Pressures on Blood Acidity, Oxygen Consumption, Volume Flow of Blood and Respiration.

JOHN W. BEAN. (Introduced by Robert Gesell.)

From the Department of Physiology, University of Michigan.

With the purpose of throwing new light on the causes of hyperpnea as seen in animals breathing pure oxygen at high pressures, apparatus was devised whereby respiration, blood pressure, blood acidity changes, and blood volume flow could be recorded on smoked paper, with the experimental animal exposed to increased oxygen pressure.

A Hutchinson type spirometer was used; the bell counterbalanced by a solenoid around a glass tube; the writing point attached to a moveable iron core in the bore of the tube which was open to atmospheric pressure. Blood pressure was recorded in similar manner, the solenoid floating on the mercury; heart rate by an electrical contact device on the femoral artery; blood acidity changes by the continuous method (manganese dioxide electrode); volume flow of blood changes by the thermo-electrical method.

The experimental animals were dogs of from 5 to 12 kg., anesthetized with morphine sulphate and urethane. The pressures used were from 3 to slightly less than 5 atmospheres pure oxygen.

The results indicate an increase in the acidity of the arterial blood and decrease in the heart rate of the animals under high oxygen pressures. The oxygen consumption of animals under pressure showed some variation but the weight of the evidence pointed to a decrease in metabolism with a tendency to return after decompression to atmospheric pressure. In several experiments periodic respiration with an accompanying periodicity in the volume flow of blood in the common carotid artery was obtained. Hyperpnea was not invariably a response to high oxygen pressure exposure. On the contrary some individuals showed a decrease in respiratory rate to the extent of apnea.

¹ Eddy, N. B., *Am. J. Physiol.*, 1929, lxxxviii, 524.

² Gesell, R., *Am. J. Physiol.*, 1929, lxxxviii, 546.