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Effects of Low Oxygen Pressure on Respiratory Phenomena.ROBERT GESELL, CHARLES BRASSFIELD, HUGO KRUEGER, HAYDEN
NICHOLSON AND MARIE PELECOVICH.*From the Department of Physiology, University of Michigan, Ann Arbor, Mich.*

Eight per cent oxygen mixtures were administered for a period of approximately 30 minutes to 3 dogs anesthetized with morphine and urethane. Such administration produced an initial decrease in oxygen consumption which was followed by an increase slightly in excess of normal. This excess oxygen consumption was ascribed to the increased muscular effort of augmented ventilation. The augmented ventilation increased the elimination of carbon dioxide considerably above normal. On readministration of room air there was a decrease in pulmonary ventilation, a relative retention of carbon dioxide and an oxygen consumption above normal. In one experiment the expiratory quotient rose to 2.86 during the period of oxygen lack and fell on readministration of room air to 0.24. During oxygen lack there was a substantial decrease in the carbon dioxide capacity of the blood which was promptly followed by an increase approaching or exceeding the initial carbon dioxide capacity. There was a similar increase and decrease in blood lactic acid. The blood lactic acid content at the end of the period of oxygen lack was only moderately increased. The lactic acid changes occurred earlier than and were smaller than the changes in blood carbon dioxide capacity. The lactic acid content of the testicle and the rectus femoris muscle before and after the period of oxygen lack was determined. The tissue was dropped in liquid air and a satisfactory suspension was obtained by sectioning in the frozen state with a rotary microtome. The lactic acid content of the testicle and of the muscle was increased during the period of oxygen lack. The amount of lactic acid in the muscle was greater than in the blood. In the testicle it was less than in the blood. This held for both conditions of oxygen plenty and oxygen lack. The hydrogen ion concentrations of the arterial blood, as measured by the quinhydrone electrode, was decreased during lowered alveolar oxygen. On readministration of room air it tended to increase slightly above the normal level. Due to the relatively small increase in the lactic acid content of the testicle and rectus femoris muscle it is tentatively concluded that the acid effect of lactic acid accumulation is exceeded by the alkaline effect of removal of free carbon dioxide associated with increased pul-

monary ventilation. Whether the calculations on the acid base equilibrium of resting tissue can be applied to the respiratory center whose activity and metabolism are augmented by oxygen lack remains to be determined by other methods. Until such crucial experiments are performed, however, our present results might be interpreted as indicating a direct stimulating action of oxygen lack independent of increased hydrogen ion concentration.

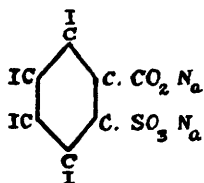
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A Pharmacological Study of Sodium Tetra-iodo-ortho-sulpho Benzoate.

DAVID I. MACHT AND DANIEL TWISS.

From the Chemical and Pharmacological Research Laboratories, Hynson, Westcott & Dunning, Baltimore.

This substance was synthesized by one of the authors and studied pharmacologically in an intensive and extensive way by the other in connection with a research instituted at the suggestion of an orthopedic surgeon, Dr. Henry Keller, of New York, in quest of a drug suitable for injection into joint cavities for facilitation of x-ray examinations. The compound is a di-sodium salt of tetra-iodo-ortho-sulpho benzoic acid having the following structural formula:



It is a beautiful light yellow crystalline powder freely soluble in water, being practically odorless and tasteless. The molecular weight of this compound is 789.68 and its iodine content, 67.72%. An isotonic solution of the salt requires a concentration of 11.3%, whereas comparative studies on sodium iodide were found to produce isotonic solutions in the concentration of 2.2%. Such an isotonic solution of the new compound contains about 4 times as much iodine as an isotonic solution of sodium iodide and, in addition, is devoid of the objectionable pharmacological features of an inorganic salt solution.