4202

Experimental Edema.

LOUIS LEITER. (Introduced by P. R. Cannon.)

From the Lasker Foundation for Medical Research and the Department of Medicine of the University of Chicago.

The consistent occurrence of a low plasma protein level in patients with chronic renal edema led to the attempt to produce a similar state in experimental animals. In the acute experiments on dogs

FIG. 1.

Dog 11. Male. Control weight 11.2 kg.; on the day of this photograph 12.8 kg. There is massive edema of the lower abdominal wall, external genitals, buttocks and thighs, less on the chest and upper abdominal wall. Constant seepage is occurring from needle-puncture wounds. Ascites was also demonstrated.

FIG. 2.

Dog 17. Male. Control weight 10.0 kg.; on the day of this photograph 12.8 kg. The rolls of edematous tissue on the neck are well shown. At the same time there were marked edema of the chest and abdominal walls and considerable ascites.

carried out several years ago in collaboration with J. F. McIntosh no edema was obtained except in 2 dogs and then not to any marked degree.

The present work is based on the development of a method for the production of *chronic* hypoproteinemia. Dogs are bled twice daily, 400 to 500 cc. of blood being withdrawn each time while the corresponding volume of erythrocytes suspended in modified Locke's solution is reinjected into the saphenous vein. 1500 cc. of 0.85% NaCl solution are given daily by stomach tube.

Edema usually appears about the fifth day, at first in the soft tissues of the prepubic region and the external genitals, later on the buttocks and thighs, and then on the abdominal and chest walls or even the neck. At the same time ascites develops, in association with hydrothorax and even pulmonary edema. The forelimbs are

involved only in extreme cases. The weight of the dog increases sharply up to 30% or 40% above the control level in spite of decreased appetite and loss of flesh. The edema usually begins when the plasma proteins have fallen to 3% or less and recedes with a rise above that level if daily bleeding is discontinued. The ascitic fluid or subcutaneous edema fluid usually has a protein content of less than 0.25% and often below 0.1%. Most of the animals have died of accidents connected with the method used. Even massive edema and ascites, however, are compatible with good general condition of the dog.

Further work is being carried on to control the various factors involved in the production of this edema.

4203

Ultraviolet Radiation; Stimulation and Inhibition in Lower Organisms.

MARIE A. HINRICHS.

From the Department of Physiology, The University of Chicago.

The statement is sometimes made that radiation depends for its effectiveness as a stimulating or an inhibiting agent upon wavelength rather than upon dosage. Quality rather than quantity is the factor which decides whether an effect is to be stimulative or inhibitory. However, a number of workers, among them Bovie, L. Loeb, and Packard, using ultraviolet, x-ray, and radium, respectively, found that it is possible to produce both types of effect with the same region of the spectrum. A survey of about 5 years' work with the lower animals shows this to be the case in at least 2 regions of the spectrum, ultraviolet, and the visible region (following the action of sensitizing dyes). While the experiments were originally not conducted to test this point, it soon became apparent that with the same spectral region, short exposures produced primarily stimulation, and longer exposures, depression. Later work included experiments in which the rate of a physiological process was modified in either of 2 directions following exposure for short and long periods to the unscreened radiation from a quartz mercury-vapor arc.

Such studies were made with yeast. Ordinary baking yeast was suspended in distilled water and exposed, in open dishes, to radiation from the quartz mercury-vapor arc at various distances from