

opticum. In the rabbit the 2 elevations present reverse at slightly different levels. This enables one so to place an electrode that to electrical stimulation these elevations are of opposite polarity.

An electrode thrust into the optic nerve back of the eyeball may be employed for electrical stimulation and recording, without serious interference with retinal stimulation by light. At a position of the recording electrode in the colliculus where the 2 elevations are of opposite sign with electrical stimulation, there also occur elevations of opposite sign after strong light flashes, enabling one to identify indirectly the firing of the different groups of fibers in the nerve activated *via* the retina. As the flash becomes weaker, the large-fiber response decreases before the small-fiber wave is materially affected. A specific interpretation of this and similar events is postponed until certain other characteristics of records obtained from the colliculus are better understood, but the prospect is that events in the retina and in the central nervous system may be correlated through the common denominator of fiber size, as detected by threshold to electrical stimulation.

## 12062 P

### Reduction of Blood CO after X-ray Treatment.\*

JOHN A. CAMERON. (Introduced by M. M. Ellis.)

*From the Department of Anatomy, University of Missouri Medical School, Columbia, Mo.*

Rapid recovery of rats<sup>1</sup> and monkeys<sup>2</sup> from severe CO effects when they were exposed to relatively small amounts of X-rays, has been previously reported. The X-rayed animals were restored to normal within a few minutes while their controls either died without regaining consciousness or exhibited a slow and laborious recovery.

This report presents the actual CO content of the blood of the treated pairs of rats in a new series of experiments. Albino rats of the Wistar stock were paired to give like ages and weights. Only male rats were employed but previous work has indicated no difference between the sexes in response to X-ray after CO.

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<sup>1</sup> Cameron, John A., *PROC. SOC. EXP. BIOL. AND MED.*, 1939, **42**, 29.

<sup>2</sup> Cameron, John A., *Radiology*, 1941, in press.

Members of a pair were simultaneously exposed to 25% CO in air and removed from the gas chamber when it was judged the limit of toleration had almost been reached. Experiments in which the control rat died from over-exposure to CO were rejected, since it was necessary to analyze the living blood of both members of the pair. Immediately after removal from the gas chamber the animals were placed in glass trays, ventral side up and one, chosen at random, was placed, unscreened, under an X-ray tube delivering 125 r per minute at the target distance used, 10 inches.† Each X-rayed rat was exposed for the same number of minutes that the animals had been left in the CO chamber; usually 6 minutes CO was followed by 6 minutes X-ray, while the control rested in his tray.

Immediately following the X-ray exposure carotid blood from each animal was analyzed with a Hilger-Spekker spectrophotometer and a Hilger medium quartz spectrograph by Dr. Victor Ells, who calculated and evaluated the data obtained.

The quartz vessels used held a mixture of .07 cc blood in 75 cc citrate solution, and allowed the beam to pass through 1 cm of the fluid. Since only one blood sample could be placed in the spectrophotometer at any one time, either the X-rayed or control blood was subject to a delay in analysis of 4 to 5 minutes. To determine whether this delay had an appreciable effect on the CO content the control blood was examined first in the odd numbered experiments, the X-rayed blood first in the even numbered experiments. No difference in results was noted in relation to the order of examination. Seven experiments were completed with satisfactory spectrophotographs of the blood of both animals and of normal (untreated) animals. Three of the 7 were odd numbers (control blood examined first) and 4 were even numbers (X-rayed blood examined first). In each case the clinical indications were as expected, the X-rayed rat actively restored and the control rat in great distress. In each the spectrophotographs indicated a significant difference (5 to 15 times the probable error) between the CO content of the X-rayed and the control blood. Fig. 1 is a graph of experiment 7 showing the relatively high CO content of the control blood.

It appears from this study that the recovery of X-rayed animals from CO effects is not due to stimulation, increased resistance, or release of reserves, unless these factors themselves are responsible for the observed changes in the CO content of the blood.

The improvement shown by the X-rayed animals may be due to

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† The X-ray machine and the services of the X-ray technician were kindly supplied by Prof. L. J. Stadler.

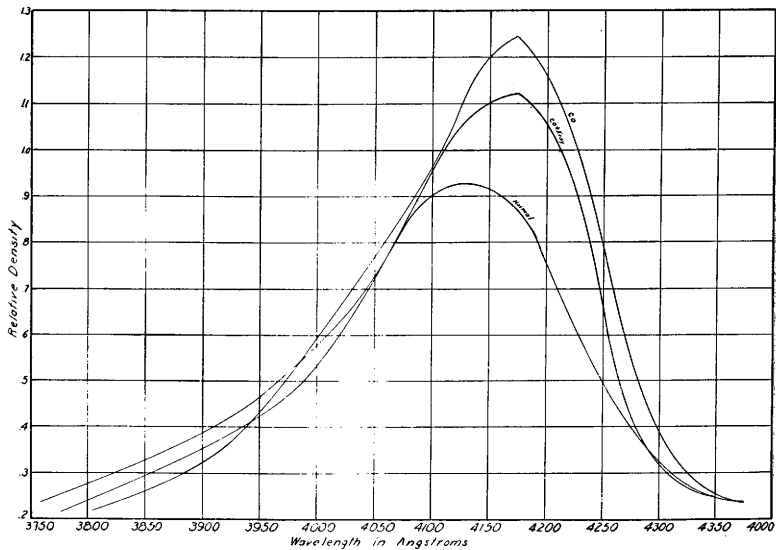


FIG. 1.

the combined effects of (1) X-ray dissociation of CO from blood cells; (2) deeper and more effective ventilation during X-ray exposure; (3) release of additional red cells into the blood stream due to X-ray effects.

## 12063

### Distribution of Cholesterol Between Blood Cells and Plasma in Rabbit and Man.

SAMUEL MEMBER, SYLVIA B. EHRLICH AND MAURICE BRUGER.

*From the Medical Research Laboratory, Department of Medicine, New York Post-Graduate Medical School and Hospital, Columbia University, New York.*

Sperry and Schoenheimer<sup>1</sup> have shown that oxalated blood plasma of humans contained significantly smaller amounts of cholesterol than serum from the same blood sample. Schmidt<sup>2</sup> had previously recorded the same observation for the phospholipids and had ascribed the difference to the fact that oxalate increased the plasma volume by abstracting water from the blood cells. As will be seen later, our observations confirm those of Sperry and Schoenheimer<sup>1</sup> but fail to agree with those of Chamberlain,<sup>3</sup> who maintained that in human

<sup>1</sup> Sperry, W. M., and Schoenheimer, R., *J. Biol. Chem.*, 1935, **110**, 655.

<sup>2</sup> Schmidt, L. H., *J. Biol. Chem.*, 1935, **109**, 449.

<sup>3</sup> Chamberlain, E. N., *J. Physiol.*, 1928, **66**, 249.