Western New York Branch.

Cornell University, Ithaca, N. Y., October 16, 1926.

3253

The Influence of Ultraviolet Light Upon Blood Platelets in Young Rabbits.

FRANCIS D. GUNN.* (Introduced by B. Roman.)

From the Laboratory of the Buffalo General Hospital, Buffalo, N. Y.

Sooy and Laurens[1] have demonstrated that sunlight produces an increase in the blood platelets and the erythrocytes of young rats. Sooy and Moise[2] have produced an increase in platelets in humans, in ten cases of idiopathic *purpura haemorrhagica,* by use of the mercury vapor quartz lamp. The latter authors also cite unpublished experiments of Sooy and Laurens, showing an increase in platelets of albino rats under lamp treatment.

In view of this, an attempt has been made to utilize ultraviolet rays in a tissue study of blood platelet regeneration in rabbits, the full results of which will be reported in the future. The present report deals with platelet and erythrocyte findings in the blood stream.

Methods. In this series 6 rabbits, all under 8 months of age, were exposed daily to the mercury vapor lamp. Treatment began with an initial exposure of 5 minutes at a distance of 16 inches, increased daily by 2 or 3 minutes to a maximum of 30 minutes. The longest period of treatment was 12 days. The backs of the animals were shaved before the first radiation and this was repeated as often as necessary.

Although the direct method of platelet counting has been satisfactorily employed by the writer in older rabbits, the difficulty in taking blood from the small ear veins of these young animals and their somewhat higher normal platelet count, resulted in frequent clotting or clumping of the platelets. Therefore, an indirect or ratio method had to be employed, which is briefly as follows:

*Fellow in Medicine, National Research Council.

After the rabbit's ear has been shaved, washed and vaselined, a vein is punctured through a drop of the diluting fluid, and as the blood wells into the drop, the mixture is drawn up into a leucocyte pipette, which had been previously filled to about one-third with the same fluid. The pipette is then completely filled with fluid, and the mixture, which consists of blood diluted 3 or 4 times, is shaken 2 minutes. If the flow of blood is very free, less of the mixture and more diluting fluid is used. The fluid consists of 5 cc. commercial formalin, 3 gm. sodium citrate, and 100 cc. physiological salt solution. Films made of the mixture are dried and stained with Wright's blood stain; or, after methyl alcohol fixation, with Giemsa's stain. At least 1,000 red cells and not less than 20 visual fields are counted. If the cells number not more than 80 nor fewer than 20 to the oil immersion field, and if the platelets are clearly discernible, even when lying beneath red cells, the slide is a useful one. During the period of rapid platelet changes 2 or more counts were made daily, at other times, only 1.

Though other advantages of this method could be mentioned, the clearness with which the very small and slender platelets can be visualized, seems its chief recommendation, especially since during the platelet crises the greatest increase seems to be in the small spindle forms.

RESULTS.

The normal average platelet count in these young animals was found to vary between 700,000 and 1,040,000, some animals varying more than others. The greatest variation in any one animal was 530,000 and the least 20,000.

Following radiation a rise in platelets was observed (see charts 1, 2 and 3), the peak occurring between the third and sixth days, and reaching a point between 1,490,000 and 1,890,000. The greatest rise in platelets was 2.3 times the original normal, the smallest rise 1.44 times that number. (See Fig. 2.)

The red cells in every case showed a progressive decrease during the first few days of radiation, a small part of which may be accounted for by slight hemorrhages. In 4 of the 6 animals the red cells began to rise, either just before or just after the platelets had reached their highest peak, the other 2 were not studied beyond this point. In the first 4 animals the original normal red cell count was recovered in 4 to 6 days after its lowest level, and in 3 of them a level of over a million higher than the original red cell count was attained in less than 2 weeks. This rise it will be seen continued for some time after the last radiation. (See Fig. 1.)

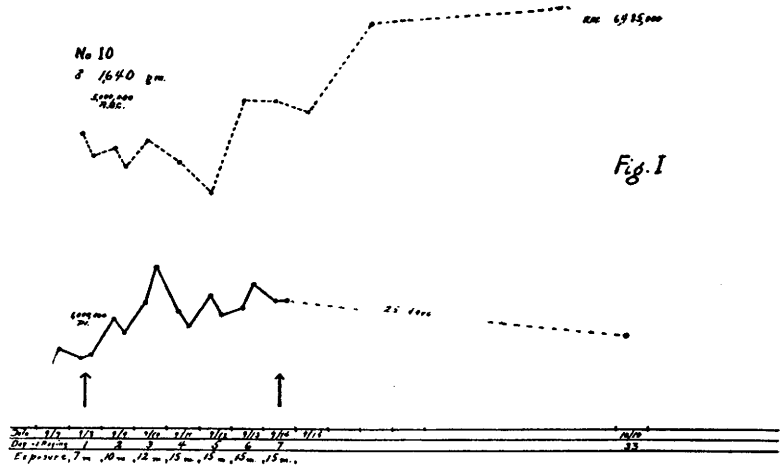

Fig. I

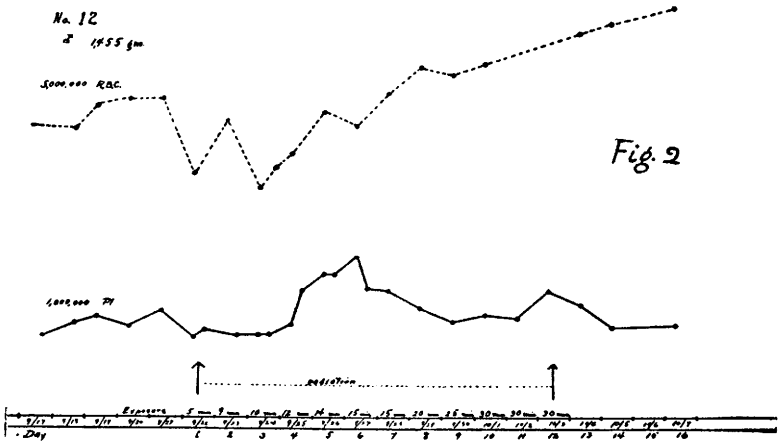

Fig. 2

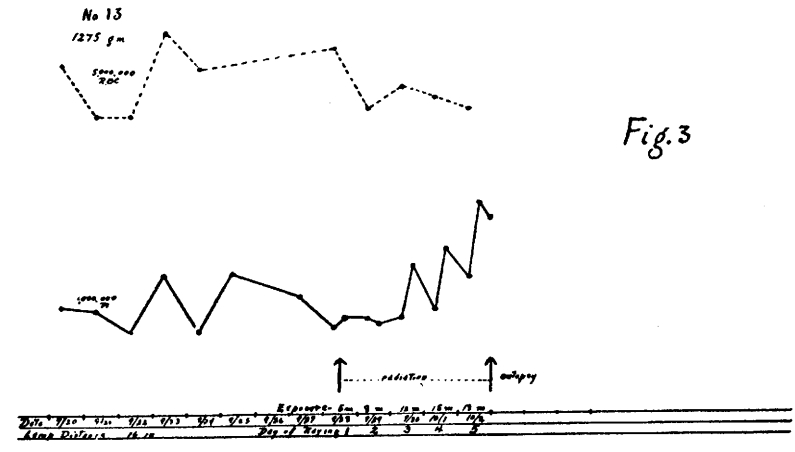

Fig. 3

The leucocytes were apparently unaffected.

SUMMARY.

(1) Exposure to the mercury vapor quartz lamp has produced, within less than a week, a distinct platelet increase, in 6 normal young rabbits.

(2) This increase varied from 40 to 100 per cent of the original normal, but always amounted to at least twice that of the normal variation in the animal. The platelet count returned to normal rather rapidly after having reached its maximum.

(3) The red cells, at first decreased, began to rise at about the time of the platelet peak, returned to normal within 6 days, reached a million above normal in 2 weeks and in 2 cases maintained this level for 3 weeks after cessation of radiation.

[1] Sooy, J. W., and Laurens, Henry, PROC. SOC. EXP. BIOL. AND MED., 1924, xxii, 114.

[2] Sooy, J. W., and Moise, T. S., *J. Am. Med. Assn.*, 1926, lxxxvii, 94.

3254

A Seasonal Occurrence of Ketonuria in Fasting Rats Accompanied by Changes in Carbohydrate Metabolism.

GERTY T. CORI AND CARL F. CORI.

From the State Institute for the Study of Malignant Diseases, Buffalo, N. Y.

It was found that in the summer months, from the 24th to the 48th hour of fasting, an average of 6.1 mg. of total acetone bodies was excreted per 100 gm. of body weight per 24 hours. The determinations were made by Van Slyke's method. Beginning with late September, the excretion diminished to 1.9 mg. per 100 gm. of body weight per 24 hours. Non-fasting rats excreted 0.4 mg. per 100 gm. per 24 hours. Metabolism experiments, made more or less continuously for a whole year, showed that from October until May the fasting respiratory quotient was in most instances above 0.700, while the opposite was true in the summer months. Since the housing, food and care of the rats was the same throughout the year, the appearance of ketonuria in the summer months was attributed to a seasonal change in fat metabolism. Apparently, in the winter months the fasting rat can oxidize its body fat completely without the simultaneous oxidation of carbohydrates, while this is