obtained before and after nephrectomy, one can conclude that DCA did not change the vascular reactivity. It should be pointed out that none of the dogs showed a significant increase in blood pressure as a result of DCA treatment. Blood pressure values obtained regularly by femoral intra-arterial puncture averaged 125 mm Hg (114-148) before and 138 mm Hg (124-150) after treatment. In no instance was there even a consistent trend of blood pressure change as a result of DCA. This is in accord with previous observations that normal dogs are resistant to DCA hypertension(3,4).

It has already been shown that hypertension elicited in dogs by silk perinephritis does not influence the vascular response to various chemical stimuli(7,9). From the present paper the same conclusion applies to DCA treated dogs. Although we found that the average responses to epinephrine, renin and angiotonin were slightly greater in DCA treated than in control rats, it is unlikely that they are significant since many hypertensive rats showed a normal or a subnormal vascular sensitivity. Furthermore, such slight differences would not be sufficient to explain persistent hypertension. The present data do not support the view that part of the pathogenesis of DCA hypertension in the rat can be explained on the basis of a functional hyper-activity of the vascular system(10).

Summary. Chronic treatment with DCA of dogs and rats, does not increase significantly vascular response to epinephrine, renin and angiotonin to explain DCA-hypertension on the basis of vascular hypersensitivity.

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Depression of Tracer Ion Uptake Curve in Rat Erythrocytes Following Total Body X-Irradiation. (17706)

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Radioactive iron given enterally or parenterally has been shown by Hahn and co-workers(1) to be incorporated into the red blood cell as an integral part of the hemoglobin molecule. In addition, an *in vitro* experiment has demonstrated the failure of radio iron introduced into the plasma to exchange with hemoglobin iron of the mature erythrocyte(2). In contrast, more recent work by Walsh *et al.*(3) indicates the ability of circulating reticulocytes to accumulate radio iron ***in vitro*** to a small extent. Thus it appears that radio iron found in circulating erythrocytes is present principally in cells that have been released from bone marrow following the administration of the tracer dose of iron. Morphologic evidence that the erythropoietic tissue of bone marrow is extremely sensitive has been provided by Bloom and Bloom(4) who found that erythroblasts disappeared from the bone marrow of rats earlier than the myeloblasts following a half lethal dose of X-rays. That this degree of radiosensitivity is compatible with the apparently contradictory findings of normal quantities of circulating erythrocytes is entirely credible when, as has been pointed out by several authors, the longevity of these

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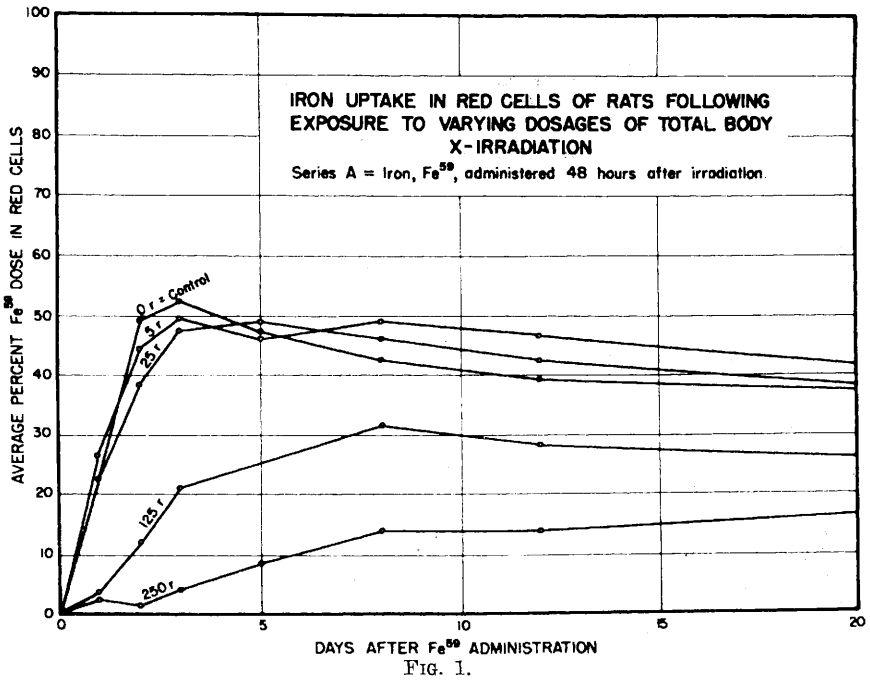

FIG. 1.

cells are considered (5-7).

In view of the ability to demonstrate newly formed red cells with tracer iron and the radiosensitivity of erythropoietic tissue a series of experiments were designed to demonstrate erythroid marrow depression following total body x-irradiation.

Methods. Groups consisting of 5 adult female Curtis Dunning rats weighing approximately 200 g were given total body x-irradiation in varying dosages. The radiation was 180 KV X-rays using ½ mm cu and 3 mm aluminum filtration. The animals were radiated individually in a lucite container, and the measurement of the radiation was accomplished with a Victoreen Ionization Chamber inserted in a lucite phantom which approximated the size of the rats used. The animals were divided into 4 series. The control series consisted of one group of 5 rats that received no irradiation. Series A and B consisted of 4 groups that received 5, 25, 125, and 250 roentgens of total body x-irradiation. Series C consisted of 3 groups that received 5, 10, and 25 roentgens. Each animal was given intravenously by tail vein a labeling dose of Fe^{59} in ½ cc of $FeCl_3$ solution which had been buffered to pH 4 with saturated sodium citrate. This dose contained 2 γ total iron and approximately .07 microcuries of Fe^{59}. In series A the labeling dose was given 2 days after the x-irradiation, in series B one day after, and in series C within 4 hours after the irradiation.

Following the administration of the labeling dose of Fe^{59} ½ cc samples of blood were drawn by means of cardiac puncture. In series A and B samples were drawn at 1, 2, 3, 5, 8, 12 and 25 days. In series C and the control group samples were drawn at 1, 2, 3, 5, 8, 12 and 61 days. The blood samples were heparinized, centrifuged at 2500 RPM for 30 minutes and the hematocrit recorded. Ten milligrams of iron carrier were added to each sample and they were ashed, electroplated, and counted as described in a previous report from this laboratory (8). The calculation of the percent uptake of the administered dose by the red cells was made by cal-

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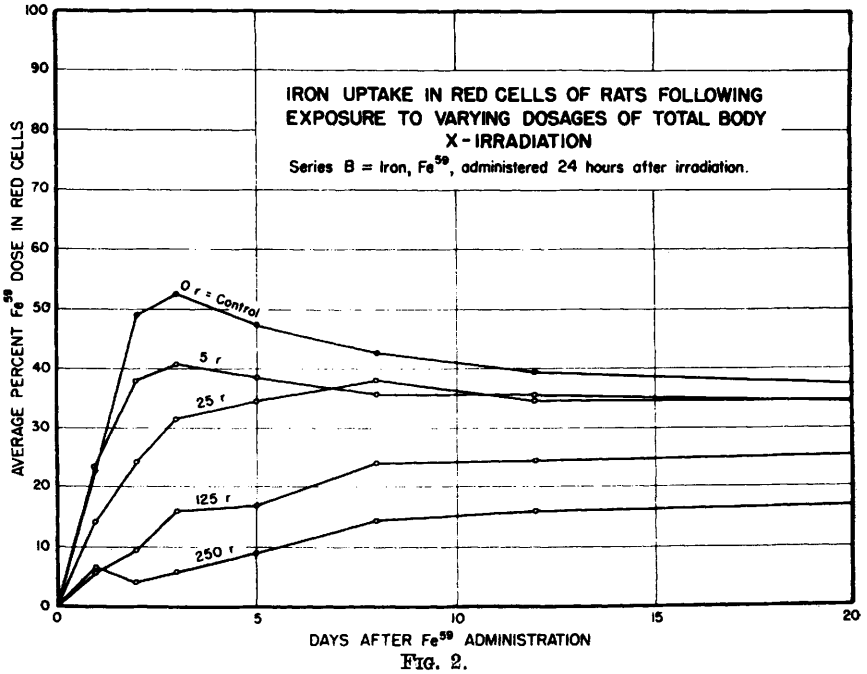

FIG. 2.

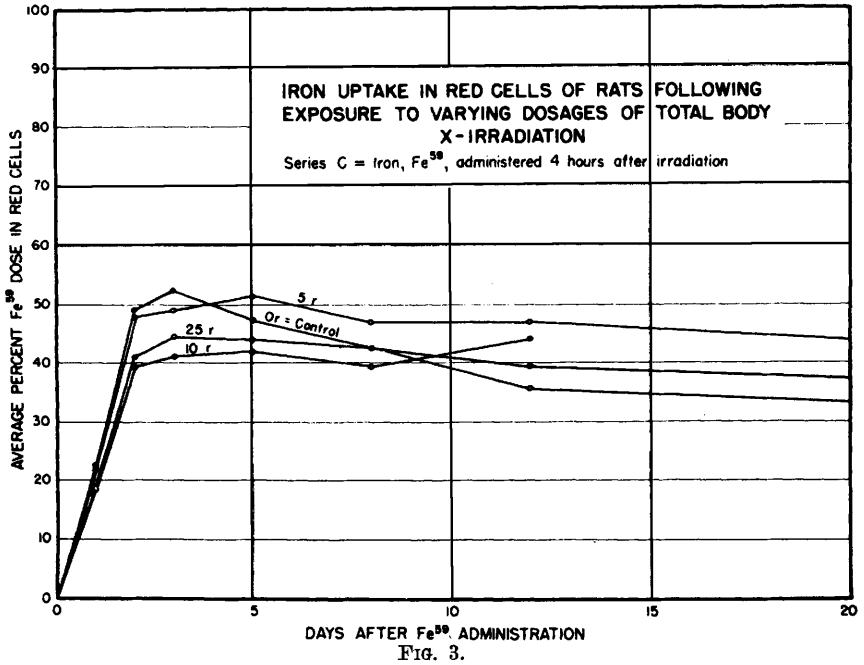

FIG. 3.

culating the blood volume on the basis of 4.59 cc/100 g body weight as given by Berlin *et al.*(8) and multiplying by the hematocrit. Then the total activity of this amount of cells as compared to the administered dose

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results in the percent uptake as given by the formula:

$$\frac{\text{Animal weight}}{100} \times 4.59 \times \text{Hematocrit} \times \frac{\text{CPM/cc of cell sample}}{\text{Total CPM injected}} \times 100 = \% \text{ dose in red cells}$$

Results. The graphs of the results obtained in series A are shown in Fig. 1, series B in Fig. 2, and series C in Fig 3. The control series results are superimposed on each graph. Each point in the graphs represents the average value of the 5 animals in the group except where there was unavoidable mortality due to cardiac puncture.

Discussion. The results obtained in these studies show that the radioactive iron red cell uptake curve is a sensitive indicator of x-irradiation damage to the bone marrow. They also confirm the histologic evidence of the sensitivity of erythroid tissue to x-irradiation.

It appears that the greatest depression in erythroid marrow activity occurs at a period of about one day after the irradiation since the groups labeled at this period show a much greater depression at the 5 and 25 roentgen levels.

Summary. 1. A method of demonstrating the depression of the erythroid portion of the bone marrow by x-irradiation with the use of Fe^{59} is presented.

2. Graphs of the red cell Fe^{59} uptake curve in rats at various dosage levels of total body x-irradiation and at varying times after irradiation are given.

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Assay of Circulating Progesterone by Ultraviolet Spectroscopy. (17707)

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The extraction and analysis of progestin from the blood of mammals has been described by Bloch(1). Although the presence of circulating progestin was corroborated by subsequent investigators, the need for a sensitive and accurate method of assay was obvious. Bloch, utilizing the bio-assay technic of Corner and Allen(2), demonstrated the presence of less than 0.2 μg of progesterone per cc of pooled sow blood. Human pregnancy serum yielded less than 1.0 μg of progesterone per cc. Haskins(3), following the bioassay procedure described by McGinty *et al.*(4), estimated the circulating progestin level in human pregnancy serum at 0.13 μg per cc, expressed as crystalline progesterone. De Allende(5), found the circulating progestin level to vary between 0.06 μg and 2.5 μg per cc of serum in the *Macacus rhesus*, during the menstrual cycle. Hooker and Forbes(6-9), using the method devised by them detected whole blood progesterone concentrations between 4 and 8 μg per cc in rabbits, mice, a

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