normal plasma or from a transient dilution anemia. The marked variability within groups receiving pooled normal plasma (S.E. of the mean 2.6-7.8) is thought to result from variations in responsiveness of individual animals to borderline amounts of hemopoietine.

It is of interest that only a single injection of anemic plasma is required to demonstrate erythropoietic activity in the sublethally irradiated animals, whereas multiple injections are required in normal animals(4,6). It has previously been observed that a single injection of PAPP, which fails to produce a significant alteration of erythropoiesis in the normal rat(9), will increase red cell production when administered to rats following a sublethal dose of irradiation (120-200 r from a 3 MEV source, 200 r from a Co^{60} source)(2). These observations suggest that immediately following irradiation an animal is more sensitive to erythropoietic stimuli than normally, provided that the dose of irradiation is not sufficient to destroy the majority of the erythropoietic tissue. It is tempting to suggest that the increased sensitivity of the irradiated animal results from the destruction of an inhibitor thus altering the normal balance between inhibitors and stimulators of erythropoiesis. The sublethally irradiated rat may serve as a useful animal for the further investigation of the regulation of erythropoiesis, since the method employed requires but a single treatment, allows a satisfactory estimate of red cell production by the Fe^{59} incorporation technic and requires only 5 days for an experiment. At present, the method requires the use of 5-7 animals per group and the inclusion of controls. The variability of response may be in part a reflection of the plasma content of hemopoietine rather than the lack of sensitivity of the test.

Summary. Injection of plasma from anemic donors into rats immediately following exposure to sublethal doses of X-rays produced a statistically significant increase in erythropoiesis as measured by Fe^{59} incorporation. The factor present in anemic plasma was nondialyzable and was not present in the supernatant obtained after precipitation of protein by heating. Normal plasma produced a variable response. Use of sublethally irradiated rat as a test animal in the study of regulation of erythropoiesis is suggested.

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Absorption and Elimination of Carbon^{14} Labelled Nicarbazin by Chickens. (22153)

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Nicarbazin, an equimolecular complex of 4, 4'-dinitrocarbanilide (DNC) and 2-hydroxy-4, 6-dimethylpyrimidine (HDP), is effective for prevention of coccidiosis in chickens(1). This complex is split into its components in the animal, and the HDP portion rapidly eliminated. By use of spectrophotometric methods, both moieties of nicarbazin have been detected in tissues of chickens receiving the drug(2). However, 2 days after

TABLE I. DNC in Chicken Tissues following the Oral Administration of Nicarbazin.

Tissue	Time after final dose (hr)	DNC and metabolites, γ/g tissue calculated as DNC	DNC (colorimetric), γ/g tissue	Ratio: Radioactive/Colorimetric
Plasma	3	4.4	3.8	1.2
	24	7.2	4.9	1.5
Liver	3	41.8	32.0	1.3
	24	67.8	33.0	2.0
Thigh muscle	3	9.7	4.8	2.0
	24	11.3	4.6	2.5
Breast muscle	3	6.8	4.7	1.4
	24	9.9	2.9	3.5

withdrawal of nicarbazin from the diet, neither DNC nor HDP could be detected in the tissues by chemical methods.

There was the possibility, however, that metabolites of DNC undetected by the chemical means used might remain in the tissues. Therefore, nicarbazin labelled with C^{14} in the benzene ring of DNC was prepared and fed to chickens. The data show that after discontinuance of treatment, both DNC and its metabolites are rapidly eliminated from the tissues.

Exp. 1. Two 200 g chickens were given oral doses of labelled nicarbazin (activity, 0.05 μc/mg)* suspended in 2% methyl cellulose solution. Each bird received 3 doses of 126 mg at 3 hour intervals. One chicken was sacrificed 3 hours, the other 24 hours after the final dose. Aliquots of aqueous tissue homogenates were dried at room temperature in stainless steel planchets and counted in a Q-gas flow counter. Counts were corrected for background and for self-absorption. Counting was done for sufficient time to assure statistical accuracy of 1% to 4%, depending upon activity of the sample. Colorimetric estimation of DNC in the homogenates was by the method previously described(2).

Results. The ratio of apparent DNC, determined by radioactivity measurements, to that found by the chemical method ranged from 1.2 to 3.5 (Table I). It is evident that DNC metabolites were present in the tissues. Although tissue samples taken 3 and 24 hours after dosing were from different chicks, the data suggested that during the 24-hour period, some accumulation of DNC metabolites had occurred.

Exp. 2. Groups of 12 chickens (one-week-old New Hampshire Reds, weighing 70-84 g) were fed diets containing 0.015% or 0.06% labelled nicarbazin. Radioactivity measurements were made on blood taken daily from 6 chickens of each group, each group of 6 being bled on alternate days. On the seventh day, 3 birds from each group were sacrificed. The remaining chicks were placed on stock rations, and 3 from each group sacrificed 1, 2

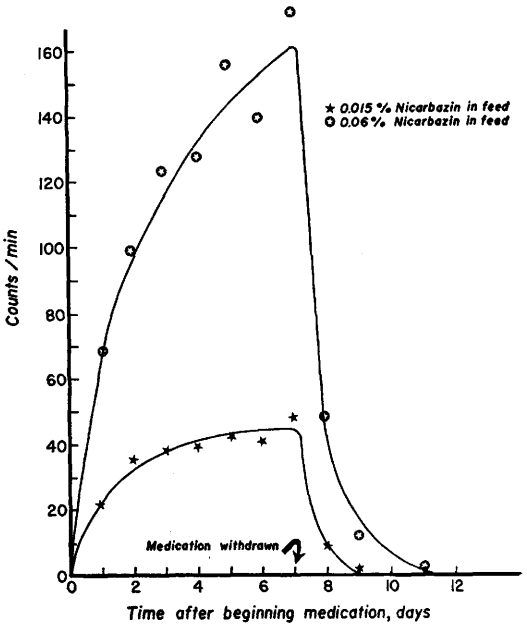

FIG. 1. Radioactivity in blood of chickens during and after medication with C^{14}-labeled nicarbazin.

* We are indebted to Dr. Elbert Harris, Chemical Division, Merck & Co., Inc., who made the material available to us.

TABLE II. DNC in Chicken Tissues after the Feeding of Nicarbazin in the Diet.

Days after medication discontinued	0	1	2	4
Tissue	DNC, γ/g wet tissue or γ/ml blood plasma			
	0.015% nicarbazin in feed			
Thigh muscle				
Radio.	1.8	.5	.35	.32
Chem.	4.1	.0	.0	—
Breast muscle				
Radio.	2.1	.6	.0	.03
Chem.	1.7	.0	.0	—
Kidney				
Radio.	9.0	.2	.05	.0
Chem.	5.5	.0	.0	—
Liver				
Radio.	14.5	3.8	.54	.01
Chem.	8.0	1.0	.0	—
Blood				
Radio.	2.7	.5	.03	.05
Chem.	1.8	.1	.0	—
	0.06% nicarbazin in feed			
Thigh muscle				
Radio.	12.1	3.3	2.0	.19
Chem.	14.3	1.9	.4	—
Breast muscle				
Radio.	7.4	2.4	.4	.24
Chem.	7.2	2.0	.0	—
Kidney				
Radio.	31.5	1.1	.17	.0
Chem.	25.7	2.9	.0	—
Liver				
Radio.	25.7	11.3	3.6	.24
Chem.	15.6	9.6	.4	—
Blood				
Radio.	9.6	2.8	.75	.14
Chem.	7.0	1.4	.1	—

and 4 days later. Tissues and blood were assayed as in Exp. 1.

Results. Radioactivity in blood of chickens fed 0.015% nicarbazin (Fig. 1) approached a plateau in the 7-day feeding period. The slope of the curve relating radioactivity to time for birds fed 0.06% nicarbazin, decreased with time. If a longer feeding period had been used, it is probable that this curve also would have approached a plateau. Withdrawal of medication was followed by a precipitous fall in radioactivity to zero in 2 to 4 days.

Radioactive counts and chemical analyses of the tissues (Table II) agreed in demonstrating that two days after withdrawal of 0.015% medication, and 4 days after withdrawal of 0.06% medication, only traces of DNC or its metabolites were present in the tissues.

Summary. Tissues of chickens fed diets containing 0.015% and 0.06% radioactive nicarbazin for 7 days contained DNC and minimal quantities of its metabolites. Two and four days, respectively, after withdrawal of 0.015% and 0.06% medication, only traces of DNC and its metabolites remained in the tissues.

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Hormone Content of Anterior Pituitary of Monkey (*Macaca mulatta*)* with Special Reference to Gonadotrophins. (22154)

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Pituitaries from monkeys, of both sexes and of different ages, have been assayed in hypophysectomized rats for their content of gonadotrophic hormones. These studies were undertaken to determine any peculiarities either in quantity or proportion of the gonadotrophic hormones, preliminary to treatment of macaques with preparations from homolo-

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