We are exploring other cases of high unitage of urinary prolan (*e. g.,* chorioepithelioma) to see if they also are characterized by the excretion of this peculiar type of gonadotropic substance.

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Effect of Radiant Energy With and Without Iron Upon Nutritional Anemia in the Rat.

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The effect of radiant energy upon the metabolism of small doses of Fe in the nutritional anemia of the rat seems to have been little studied. Foster[1] produced anemia in rats by milk feeding and observed the effect of radiant energy in preventing and curing this type of anemia. There was a slight but definite effect in increasing the hemoglobin and the number, size and saturation of the red cells.

We have made the following studies upon the effect of radiant energy upon both the prevention and cure of nutritional anemia in the rat.

Preventive Studies. Young rats at weaning were fed upon whole milk. Daily doses of pure Fe from 0.05 to 0.30 mg. were given, with and without ¾ hour ultraviolet irradiation of the rat daily, with the General Electric Sunlight Mazda Lamp, Type S-I, at a distance of 4 feet. This lamp has recently been described by Carter.[2] Weekly estimations of hemoglobin and red cell counts were made by the technique described by Beard and Myers.[3]

With milk alone, milk plus irradiation, irradiated milk, and milk plus 0.05 mg. Fe daily the anemia became progressively worse. There was a striking effect of irradiation on red cell recovery with both 0.05 and 0.10 mg. Fe daily, namely, a drop of 41 and 0.6% on these doses of iron may be compared to an *increase* of 33 and 50% when ¾ hour irradiation was given. The anemia was prevented by daily doses of Fe from 0.15 to 0.30 mg. These doses with irradiation were also much more effective in preventing the anemia than

[1] Foster, P. C., *J. Nutr.*, 1932, **4**, 517.

[2] Carter, H. A., *J. Am. Med. Assn.*, 1932, **99**, 31.

[3] Beard, H. H., and Myers, V. C., *J. Biol. Chem.*, 1931, **94**, 71.

were these doses of Fe alone, with the exception of the 0.25 mg. dose. Irradiated milk with 0.30 mg. Fe daily gave a much more striking increase in both cells and hemoglobin than any other type of therapy used in this study. These results are given in Table I.

A polycythemia occurred in 4 animals on doses of Fe alone and in 12 animals on Fe and irradiation.

Curative Studies. At the end of 6-8 weeks milk feeding, the anemic young rats were given the same treatment outlined above. The most marked effect of the irradiation on red cell and hemoglobin recovery was again demonstrated with 0.05 mg. Fe daily. But the irradiation with doses of Fe from 0.10 to 0.30 mg. had no better effect upon hemoglobin recovery than these doses of Fe alone, with the exception of the 0.25 mg. group. Hemoglobin values of 8-11 gm. per 100 cc. were obtained in all these groups in 7-10 weeks which was somewhat slower than we have previously reported. Red cell recovery was excellent in all these groups and was more marked with 0.15, 0.20 and 0.30 mg. Fe daily than it was with these doses of Fe alone. (Table II.)

A polycythemia occurred in 9 cases with Fe alone and in 22 cases on Fe with irradiation, being most pronounced with 0.20 mg. Fe than with any other dose. In some animals this polycythemia was still present at the end of the 10 weeks experimental period and in others a normal cell count of 8-9 m/cu.mm. occurred in about 2 weeks after the highest values were obtained.

A total of 224 animals were used in these studies and in a large number of them a daily milk intake above 50 cc. was rarely seen.

It is evident that the beneficial effect of irradiation of the rat and the milk observed is due to the formation of vitamin D under these conditions. To test this point further 2 anemic rats were given 0.30 mg. Fe daily with the addition of 1 drop of a potent vitamin D preparation added daily to the milk. The results were as follows:

	Hemoglobin gm./100cc.		R.B.C. m/cu.mm.		Time of recovery Weeks	
Rat. No.	Before	After	Before	After	Hb	R.B.C.
1177	3.0	15.4	3.99	7.42	6	2
1178	5.0	14.3	3.80	7.42	6	3

Evidently our milk was lacking in vitamin D and when this was added, either by irradiating the rat, milk, or adding vitamin D to the milk, hemoglobin and red cell recovery took place in exactly the same time as occurred in our previous studies. We believe that the somewhat slower responses in red cells and hemoglobin observed in the present studies were due, not to a need for Cu, but rather to a

TABLE I
Summary of Prevention Experiments.

No. Rats	Aver. % change Body Wt.	Hb.	R.B.C.	Time of Recovery Weeks Hb.	R.B.C.	Diet
6	+112	−63	−51	5	5	Milk alone.
9	+118	−51	−39	5	5	Irrad. milk
13	+109	−54	−39	5	5	Milk + ¾ hr. irrad.daily
5	+190	−49	−41	7	7	Milk + .05 mg. Fe daily
9	+290	−18	+33	10	10	Milk + .05 mg. Fe + ¾ hr. irrad. daily.
4	+227	−0.4	−0.7	10	10	Milk + .1 mg. Fe daily
9	+295	−9.0	+49	10	10	Milk + .1 mg. Fe daily + ¾ hr. irrad. daily.
5	+354	+ 8	+62	10	10	Milk + .15 mg. Fe daily.
10	+420	+15	+92	10	10	Milk + .15 mg. Fe + ¾ hr. irrad. daily.
5	+509	+18	+51	10	10	Milk + .20 mg. Fe daily
10	+355	+23	+77	10	10	Milk + .20 mg. Fe + ¾ hr. irrad. daily.
5	+501	+44	+77	10	10	Milk + .25 mg. Fe daily
10	+452	+34	+60	10	10	Milk + .25 mg. Fe + ¾ hr. irrad. daily.
5	+311	+17	+49	10	10	Milk + .3 mg. Fe daily
7	+331	+26	+80	10	10	Milk + .3 mg. Fe + ¾ hr. irrad. daily.
10	+502	+94	+109	10	10	Irrad. milk + .3 mg. Fe daily.

TABLE II
Summary of Curative Experiments.

No. Rats	Average % change in Body Wt.	Hb.	R.B.C.	Time of Recovery Weeks Hb.	R.B.C.	Diet
10	+74	−2	+23	9	9	Milk alone.
12	−1	−14	−11	5	5	Milk + ¾ hr. irrad. daily.
5	+61	+6	+13	4	4	Milk + .05 mg. Fe daily.
9	+121	+69	+85	6	8	Milk + .05 mg. Fe + ¾ hr. irrad. daily.
3	+170	+161	+273	9	8	Milk + .1 mg. Fe daily.
7	+93	+139	+194	7	9	Milk + .1 mg. Fe daily + ¾ hr. irrad. daily.
6	+194	+146	+187	7	8	Milk + .15 mg. Fe daily.
8	+82	+83	+221	7	8	Milk + .15 mg. Fe + ¾ hr. irrad. daily.
6	+180	+229	+287	9	9	Milk + .2 mg. Fe daily.
6	+78	+223	+344	8	7	Milk + .2 mg. Fe + ¾ hr. irrad. daily.
4	+176	+151	+272	9	8	Milk + .25 mg. Fe daily.
10	+86	+233	+276	7	7	Milk + .25 mg. Fe + ¾ hr. irrad. daily.
5	+227	+248	+238	8	8	Milk + .3 mg. Fe daily.
11	+172	+180	+273	7	8	Milk + .3 mg. Fe + ¾ hr. irrad. daily.

need of vitamin D with Fe. This again confirms our view that the nutritive value of the milk and its daily quantitative intake are factors of importance in Fe metabolism in studies of nutritional anemia in the rat.

We have data to show that the above effects were not due to the Cu content of either our milk or Fe solutions. It would seem that negative reports of the effect of Fe alone upon hemoglobin recovery in anemia studies would be of limited value unless definite assurance is given that the vitamin D content of the milk used is adequate. Work along this line is in progress.

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Relative Inagglutinability of the Castellani-Sonne Group of Dysentery Bacilli.

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During the summers of 1931 and 1932 five strains of the Castellani-Sonne or Thjøtta type III dysentery bacilli were isolated at the Babies and Childrens Hospital from the stools of 5 children under 5 years of age. All the patients showed a typical course of dysentery infection. Among them one death occurred. It is emphasized here that increasing proof of the prevalence of this type of dysentery apparently is forthcoming. Especial attention should, therefore, be given to the isolation and identification of this type organism.

The organisms were minute, non-motile, gram negative rods, readily acidifying glucose, mannite, maltose, and rhamnose. Lactose was slowly acidified (one to 2 weeks) and the same was true for sucrose. Litmus milk was acidified by all strains and coagulated by 4 strains. Indole was not formed. In broth, marked sedimentation occurred, but there was no pellicle formation. The cultural characteristics of these 5 strains closely corresponded to those observed in 2 typical strains, No. 268 and Sonne B, obtained through the courtesy of Dr. S. A. Koser. Three out of 5 of our strains and the 2 Koser strains clotted milk in 21 days. The same basic reactions were described by Wiseman,[1] Fyfe,[2] Braun and Weil,[3]

[1] Wiseman, W. R., *Lancet*, 1927, **1**, 817; *J. Hyg.*, 1927, **26**, 187.

[2] Fyfe, G. M., *J. Hyg.*, 1927, **26**, 271.

[3] Braun, H., and Weil, A. J., *Centralbl. f. Bakteriol.* (Abt. 1), 1928, **109**, 16.