

on both sides of a double chambered Neubauer hemocytometer were counted by 2 workers for each animal.

After the average normal platelet count was obtained, the rat was bilaterally adrenalectomized. Two days were allowed for recovery from the operation and on alternate days, thereafter, the numbers of platelets were enumerated until death occurred from adrenal insufficiency. The results obtained on the 13 rats of the group which died of adrenal insufficiency are recorded in Table I. They averaged 477,350 in the normal state and 840,270 just before death, an average increase of 76%.

The total number of white cells in the blood of 34 normal rats averaged 11,319 while just before death from adrenal insufficiency the leucocytes averaged 17,576 per cubic millimeter of blood. This leucocytosis is in agreement with the observations made by Zwemer and Lyons¹ and also by Corey and Britton² on adrenalectomized cats.

Differential white cell counts were made on a group of 19 rats before and after adrenalectomy. In the normal state the lymphocytes averaged 81.2%, two days after operation 84.7% and just before death from adrenal insufficiency 88.4%. With the increase in lymphocytes there was a concomitant decrease in the neutrophils. The numbers of the other types of white blood cells seemed unchanged.

7784 P

Bacteriostatic Action of Irradiated Dye Media

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The writer has observed that the growth of bacterial organisms is inhibited on culture plates which contain photosensitizing dyes, and which have been exposed to light of relatively low intensities. The culture media used were eosin-methylene blue, and Salle plates, the latter containing erythrosine, brom-cresol-purple, and methylene blue. When *B. coli* and *B. aerogenes* were streaked upon such irradiated plates, growth generally did not occur when the plates were subsequently incubated at 37°C. Plain agar plates containing no

¹ Zwemer, R. L., and Lyons, G., *Am. J. Physiol.*, 1928, **96**, 545.

² Corey, E. L., and Britton, S. W., *Am. J. Physiol.*, 1932, **102**, 699.

dyes showed no inhibition of growth when subjected to the same treatment.

In some cases the quantity of light which produced these changes in the plates was very small, *e. g.*, an exposure $2\frac{1}{2}$ minutes to the diffuse light of the laboratory inhibited growth on the Salle plates, although 30 minutes was the minimum time of exposure which produced inhibition on eosin-methylene blue.

Measurements of the intensity of incident light can mean very little beyond the practical finding that ordinary diffuse laboratory light is effective in producing noticeable inhibition. This is true because the bacterial growth is limited to the surface, which is also the region of greatest absorption of light. Thus if sufficient light is absorbed at the surface layer to activate 90% of the dye molecules in this region, a great increase in intensity could not greatly increase the inhibitory effect on bacterial growth, although it might produce more change at greater depth. We have found that the inhibitory effect can be removed by washing the surface of the agar, indicating that the effects are generally limited to this region. This may also be a function of the O_2 concentration, which must be greatest at the surface, since O_2 is a necessary component of the common photochemical reaction of these dyes.^{1, 2}

With more intense irradiation, *e. g.*, exposure to direct sunlight, the plates are definitely bleached. The destructive effects of previously irradiated fluorescein dyes, to which group both eosine and erythrosine belong, has been demonstrated by Moore³ for the killing of sea urchin eggs, and by Blum⁴ for the hemolysis of erythrocytes. Blum and Spealman⁵ have presented evidence to show that the destructive action is associated with the bleaching of the dye but not with the presence of H_2O_2 , although this latter substance is formed.²

In all these experiments the light passed through the pyrex or glass covers of the Petri dishes, which remove the ultra-violet wave lengths ordinarily active on organisms and media. Thus the effects are undoubtedly due to the activation of the dye molecules, principally by visible light, and the phenomenon must be classed with photodynamic action.⁶

¹ Blum, H. F., and Spealman, C. R., *J. Phys. Chem.*, 1933, **37**, 1123.

² Blum, H. F., and Spealman, C. R., *Am. J. Physiol.*, 1934, **109**, 605.

³ Moore, A. R., *Arch. di Sci. Biol.*, 1928, **12**, 231.

⁴ Blum, H. F., *Biol. Bull.*, 1930, **58**, 224.

⁵ Blum, H. F., and Spealman, C. R., *PROC. SOC. EXP. BIOL. AND MED.*, 1934, **31**, 1007.

⁶ Blum, H. F., *Physiol. Rev.*, 1932, **12**, 23.

Further work is in progress and the present preliminary note is published merely to call attention to the possible error that may be introduced by failure to guard bacterial media containing photo-active dyes from light.

7785 P

Effect of Thyroxin Injections upon the Feather of the Guinea Fowl.

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This paper presents a preliminary report of an analysis of the effect of hypernormal concentrations of thyroxin upon an embryonic organ, the feather germ.

The writer has demonstrated previously¹ that the feather pattern of the guinea is formed by repetition of a pattern unit, a transverse row of spots, which recurs after the lapse of a definite period of time, constant for an individual bird. This pattern period may be calculated, and furthermore the beginning and the end of a period may be distinguished easily in a definitive feather or in a growing germ.

In the experiments to be reported, 10 guinea fowls, 5 males and 5 females, were injected with solutions of Squibb's crystalline thyroxin in single injections as well as double and triple injections separated by 4 to 9 days, the doses ranging from 2 to 6 mg. The birds weighed between 2½ and 3 lbs. Juhn and Barnes² produced an area of abnormal black pigmentation in brown Leghorns with doses as small as 0.5 mg. Although the guinea is a smaller bird, doses of thyroxin 12 times as large as this failed to produce any analogous change in pigmentation. On the other hand, doses less than 12 mg. cause no molting in the brown Leghorn,³ while in the guinea 4 mg. is sufficient to produce general molting. No sex differences were noted in the susceptibility of guinea feathers to thyroxin.

Comparison of large areas of feathers treated with 4 mg. of thyroxin with their predecessors and successors grown from the

¹ Hardesty, Mary, *J. Exp. Zool.*, 1933, **66**, 53.

² Juhn, Mary, and Barnes, B. O., *Am. J. Physiol.*, 1931, **98**, 69.

³ Lillie, F. R., and Juhn, Mary, *Physiol. Zool.*, 1932, **5**, 124.