

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.

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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.

same follicles—subcutaneous injections of India ink identified individual follicles—showed that the thyroxin feathers broke more easily, that they were shorter, that they carried fewer barbs, and that they required a shorter time to reach maturity. The contour of the feathers was concave, due to shorter barbs in the affected region.

Injections of thyroxin left the pigmentation period unaltered. However, minor but definite transpositions occurred in the pattern of a feather growing during the presence of hypernormal concentrations of thyroxin in the blood stream. The pattern modifications extended over 2 pattern periods.

Feathers whose tips were grown under the influence of thyroxin were more blunt in outline than controls, and the initial spot was shorter along the long axis of the feather, and at the same time broader laterally. When the thyroxin effect reached the feather at a lower level on the vane the spots of the first affected pattern period were smaller and lay closer to the transverse row above than in the controls; in the second pattern period the spots were larger and lay farther from the row above.

Measurements under the compound microscope with the aid of a mechanical stage showed that the barbs in the region affected by thyroxin were spaced first closer together and then farther apart along the rachis than the corresponding barbs in controls. This difference in the spacing of the barbs, together with an increase in the growth rate of individual barbs, which was ascertained by the methods described previously, accounts for the changes in the shape and arrangement of the spots appearing in the pattern of feathers grown under the influence of thyroxin.

Various data, some of which have not been mentioned here indicate that the differences in barb spacing are in turn due to a more rapid deposition of barbs at the ventral side of the collar, and to 2 complementary changes in the growth rate of the rachis.