

Summary. It has been shown in the case of the post-pubertal albino rat that: 1. The variability of Q_{O_2} , based upon wet weight determinations, is no greater than when based upon determination of dry weight. 2. Organs and tissues differ significantly in respect to mean value of wet/dry weight ratio.

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Effect of Thyroxine on Eruption of Teeth in Newborn Rats.

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The relation of the thyroid gland to the rate of differentiation of the organism is well known. An excess of the thyroid hormone causes the individual more rapidly to assume its adult structure, as, for instance, in the effect of thyroxine in the acceleration of metamorphosis in tadpoles, or in the more rapid appearance and uniting of ossification centers in the bones of various mammals. Conversely, a thyroid hormone deficiency decreases growth and differentiation and the organism tends to remain infantile. Although this tendency is well recognized and accepted, a more thorough study as to the effect of thyroxine on the rate of differentiation of the various organ systems of the mammal is indicated.

Hoskins¹ first began this type of study in young rats. They were injected starting at the third day after delivery with 0.1 mg of acetyl-thyroxine at 2- to 3-day intervals until the fifteenth day. She observed a more mature external appearance, the fur appeared more rapidly, the nails were longer, the shape of the skull narrower and epiphyseal activity was increased.

In the preliminary stages of a more detailed investigation of a similar problem we noted that the injection of thyroxine had a very marked and specific effect on the rate of eruption of teeth that was more noticeable than any other single change in the young rat. Since Hoskins began her injections on the third day and spaced them at 2- to 3-day intervals her quantitative observations were not as accurate as ours, but she states "Another difference to be seen at this period is the precocious eruption of the incisor teeth, which are visible at least 2 days earlier in the injected than in the control ani-

¹ Hoskins, M. M., *J. Exp. Zool.*, 1927, **48**, 373.

mals." We know of no further precise observations on the acceleration of the eruption of teeth in young rats by the use of thyroxine.

A litter of 5 newborn rats were injected with thyroxine-Roche, 0.05 cc (100 gamma of crystalline thyroxine) daily for 6 days. The injections were made subcutaneously in the dorsum of the rat. On the third day after birth, between 70 and 80 hours, it was noted that both the upper and lower incisor teeth had erupted. These rats lived to 6 days and then died of hyperthyroidism. Another group of 4 litters (20 rats) were subjected to the same dosage and it was consistently noted that the incisors appeared as small white spots just under the gingival mucosa at 50 to 60 hours after birth, and by 70 to 80 hours they were visibly erupted. In the controls (2 litters of 9 rats injected with 0.05 cc 10% alcohol) the teeth became visible to a similar degree between 120 and 130 hours (fifth day) and did not erupt until after 192 hours (eighth day). Donaldson² reports similar findings on the eruption of normal rat incisors. The acceleration of the rate of incisor teeth eruption from the eighth day to the third day is a distinct, easily observable and rapidly manifested action of thyroxine.

The dosage used in the above series was found to be extremely large. The injection of a single dose of 0.05 cc of thyroxine at birth in a litter of 5 rats caused the incisors to erupt between 80 and 90 hours; and 0.04 cc dose at birth in another litter of 4 rats caused the incisors to erupt at 90 to 96 hours.

We have not yet had an opportunity to standardize thyroxine dosage to time of teeth eruption except as indicated above, but the possibility of this observation lending itself to the standardization of the thyrotropic hormone suggested itself. Although the rat is known to be unusually refractory to the thyrotropic hormone the method was worth trying. A preparation of anterior pituitary of known thyrotropic potency* was used. 0.1 cc of the material was injected subcutaneously daily from birth until the eighth day in a litter of 5 rats. Doses of 0.2 cc were found to be fatal in newborn rats. No perceptible change in the rate of eruption of teeth was observed, and they appeared as in the controls between the eighth and ninth days. In this small series no response of the teeth to the thyrotropic hor-

² Donaldson, H. H., *The Rat*, 1924, Wistar Inst. Anat. and Biol.

* The anterior pituitary used was a Squibb's preparation standardized at 10 Growth Units/cc. It was furnished by Dr. Evelyn Anderson of the University of California Medical School. She states its thyrotropic content is as follows: 0.1cc/day for 3 days to an immature guinea pig will cause a rise of 20% in the BMR at the end of that time.

none was detected, and the use of the eruption of the rat tooth as a method of standardizing the thyrotropic hormone was shown to be of no value.

Summary. (1) The rate of the incisor teeth eruption in newborn rats is markedly accelerated by thyroxine; time of eruption varying with the dosage used. (2) The use of this observation as a method of standardizing the thyrotropic hormone was unsuccessful.

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Specificity of Graminae Pollens as Evidenced by Precipitin Reactions.*

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Caulfeild¹ reported that guinea pigs can easily be sensitized with extracts of ragweed pollen precipitated with alum. During the last year we have produced hypersensitivity in guinea pigs with extracts of graminae pollens precipitated with alum and have demonstrated this state of hypersensitivity by the production of varying degrees of typical anaphylactic shock 3 to 5 weeks after sensitization of such animals.

In this paper we wish to report the results of specific precipitin tests of sera of such sensitized guinea pigs to extracts of their specific antigen pollens as well as to extracts of various other graminae pollens.

Pollen extracts were made according to Caulfeild's methods.¹ Groups of 5 guinea pigs each were sensitized with freshly prepared extracts of each of the following pollens: *Lolium perenne* (English rye grass), *Avena fatua* (wild oats), and *Bromus carinatus* (brome grass). In addition 3 animals were sensitized to *Cynodon dactylon* (Bermuda grass). One cc of extract was injected subcutaneously on 2 successive days to produce sensitization.† Anti-sera were ob-

* The authors thank Dr. Leonard Ginzton for suggestions given concerning experimental technic.

¹ Caulfeild, A. H. W., *J. Allergy*, 1936, 7, 451.

† The use of 2.5 cc or 5.0 cc of the same extract in one injection sensitized guinea pigs as well or possibly better in Caulfeild's experiments.