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Measurements of Bone Growth by Alizarine Injections.*

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Sixteen white rats 3 months of age were given 2 intraperitoneal injections of 0.5 cc. of 2% Alizarine Red S (Sodium Sulphalizarate) of color index 1034 (Coleman and Bell Company) 4 or 6 days apart and killed 2 days after the last injection. The dosage ranged from 39 to 62 mg. per kg.

Microscopic examination of transverse ground sections of the mid-root level of the upper molar teeth showed a red line in the alveolar bone that was calcifying at the time of each injection.

The amount of bone laid down in 24 hours was obtained by measuring the vertical distance between the 2 red lines in μ and dividing this amount by the number of days intervening between the 2 injections. The measurements were made of fields in which the 2 red lines followed a parallel course for at least a short distance. Tangential planes were avoided.

A total of 471 measurements were made by M. M. Hoffman, M. Engel and the author, who found the average amount of alveolar bone growth per 24 hours to be 4(3.98), 4(4.04) and 4(3.99) μ respectively. The range was 1.62-6.60 μ . Sixty-eight per cent of the measurements ranged between 3.5 to 4.5 μ and 87% ranged between 3 and 5 μ per 24 hours (Fig. 1). It is interesting that the daily amount of alveolar bone apposition was found to be approximately one-fourth the amount of the daily apposition (16 μ) of enamel and dentin in the incisor of the rat.¹

The alveolar bone was found to be a favorable site for these

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¹ Schour, I., and Steadman, S. R., *Anat. Rec.*, 1935, **63**, 325.

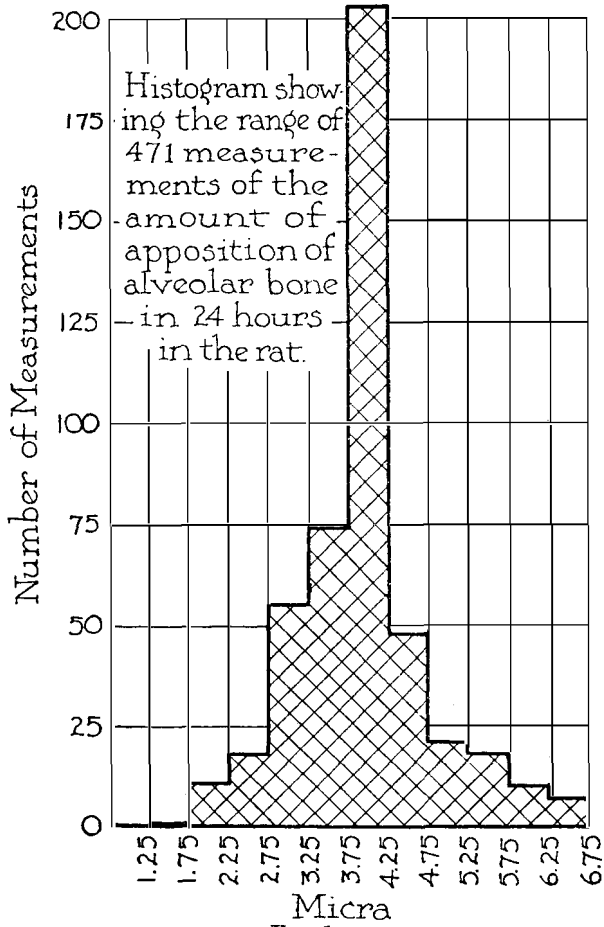


FIG. 1.

measurements because it grows continuously throughout life in its adjustment to the microscopic and physiologic movement of the teeth.

Multiple injections of sodium sulphalizarate present advantages over feeding of madder or alizarine and offer a prompt and accurate method of measuring the rate of apposition of bone in normal and experimental conditions.

Experiments are being continued in which this method is applied for the purpose of measuring the amount of daily apposition of enamel, dentin and bone in higher animals.