

THYROID AND GROWTH

EFFECT OF THYROID HORMONE ON GROWTH IN
THYROTOXIC AND MYXEDEMATOUS CHILDREN AND ADOLESCENTS

SAUL HERTZ, M.D., AND CARLOS
GALLI-MAININI, M.D.

From the Department of Medicine, Harvard Medical
School and Massachusetts General Hospital,
Boston, Massachusetts

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INCREASE in length of an organism takes place in the early part of its life, and depends upon many factors. The harmonious relationship among these factors produces the normal and constant increase in length which is terminated when ossification is completed at the epiphyseal zones of growth. With the cessation of ossification and union of diaphyses and epiphyses the morphological and physiological maturity of the organism is usually reached.

The factors concerned with growth and maturity have been pointed out by many authors (1-11). It is difficult to establish a classification of these factors because there is complex interaction among them. This fundamental 'substrate,' by which is meant the inherent capacity of the cells of the organism to divide and produce new elements, has intrinsic characteristics due to hereditary factors which condition growth to a certain extent; and it is the 'substrate' upon which other factors operate.

Some factors, such as diet, may ultimately accomplish increase in mass by supplying the cells with the material necessary for their growth and division. Vitamins and hormones regulate cell metabolism and are responsible for growth and differentiation. We have to distinguish, therefore, between simple increase in mass such as can be produced by excessive diet and increase in mass resulting from growth and differentiation in which vitamins and hormones are involved.

Alteration of the capacity of the substrate can be illustrated clinically in cases of retardation of growth in the course of chronic disease. This interference with growth can be seen in the so-called zones of cessation of growth in the bones (12) and in the acceleration and retardation of ossification (13-17). The existence of a definite minimum effective dose and of a limit of maximum stimulation beyond which there is

involved. We selected all the cases of definitely proved ophthalmic goiter in our juvenile group, that is all patients of 20 years or under. There were 121 cases, 13 boys and 108 girls. For comparison we have selected a few cases of juvenile hypothyroidism which we have had occasion to observe, 1 boy and 7 girls. From the 121 cases we exclude the boys for simplicity in graphic representation and 3 cases with independent chronic disease, thus leaving 104 cases with

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