

logical method for the estimation of the hormone in human blood.<sup>6</sup>

The name growth hormone is likely to suggest that the function of the hormone is limited to the period of growth and to obscure the possibility that this most anabolic of agents may be physiologically important throughout life. Although the opportunity to evaluate growth hormone in human physiology and disease has only recently become possible, it has been seen that man continues to secrete growth hormone in adult life,<sup>6,21</sup> and that the mature and even the aged exhibit metabolic effects from administered human growth hormone.<sup>18</sup> The availability of human growth hormone promises to open up a field of clinical investigation of wide scope and interest.

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## BOOK REVIEW

INSULIN CRYSTALS. By Jørgen Schlichtkrull. *d. kr.* 30 (\$4.35), pp. 140, Ejnar Munksgaard, Publishers, Copenhagen, 1958.

The studies described in Schlichtkrull's monograph were initiated in 1950 in conjunction with other investigators in the Novo Laboratories in Copenhagen. In the succeeding years this team systematically investigated various aspects of the chemical, biological, and clinical factors influencing the relationship of zinc and insulin, and uncovered much new knowledge about the timing of insulin suspensions. They discovered that long-acting preparations could be prepared without the addition of foreign protein modifying agents, a finding which eventuated in the development of Lente insulin preparations. The present report extends still further these studies of the physicochemical factors involved in crystal suspensions containing no added zinc ions, but which do show a protracted action. When ordi-

nary beef insulin crystals containing two atoms of zinc per unit-cell (or more) were subjected to the influence of temperature under certain conditions, the time action was prolonged. Urea, formamide, and halide in the medium resulted in the formation of sharp-edged single-rhombohedral having still more prolonged effects. A variety of timings may be produced, but it is not yet known whether these preparations are useful clinically, or whether they have any advantages in therapy.

The monograph is attractively printed and illustrated. The author has succeeded in presenting highly technical data in an understandable manner and he has included background summaries of previous work which are documented by the important bibliographical references. His illustrations of crystal structure are particularly noteworthy. The work represents a significant contribution to knowledge in a field that is not widely followed.