

THE CONTROL OF HUNGER IN HEALTH AND DISEASE

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The Control of Hunger in Health and Disease by Anton Julius Carlson

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ANTON JULIUS CARLSON

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By

ANTON JULIUS CARLSON



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PREFACE

The following pages contain a summary of the work on the stomach, with special reference to hunger and appetite, carried out in the Hull Physiological Laboratory of the University of Chicago during the last four years. We have aimed to present this digest in the light of the entire biological and clinical literature on the subject, hoping that it may encourage more intensive work on hunger and appetite control, particularly in the fields of clinical medicine and comparative physiology, as the work of the past on this problem is not commensurate with its biological, medical, and economic importance.

The complete analysis of hunger may not yield us control over the hunger mechanism, but it is at least the most promising line of attack. The scientist will concede its value to biology, and the physician readily appreciates its significance for rational therapeutics; but the layman may question the practical utility of hunger control to society as a whole, in view of the fact that it has played no rôle in past evolution. This is granted. But the elimination of many biological correctives by the artificialities of modern civilization calls for rational guidance of all phases of human behavior, including the desire for food. In these times of plenty, overfeeding, with its physiological penalties and economic waste, is on the whole more prevalent than undernutrition, because of the barbaric indulgence in the pleasures of the table in the absence of the physical stress of more primitive social condition. And when hunger becomes pathologically exaggerated the physician of today knows no remedy; when it fails in disease, he dispenses the "bitter herb" of tradition—and hopes for the best. Hence, when the reader has followed us through these we hope not too technical pages, we believe that he will agree that there is yet much work to be done on the problem of hunger control—work worth doing, co-operative work of the clinic and the biological laboratory.

A. J. CARLSON

UNIVERSITY OF CHICAGO
September, 1916

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CHAPTER I

THE BIOLOGICAL SIGNIFICANCE OF HUNGER

I. HUNGER IN THE UNICELLULAR ANIMALS

The complex of sensation that in man and the higher animals urges and compels to ingestion of food is called hunger and appetite. From the standpoint of the persistence of living organisms the ingestion of food is as important as reproduction. Consequently the hunger sensation is as fundamental as the urge or appetite of sex. In fact, if we define hunger biologically as the conditions (rather than the sensation complex) that lead to taking food, hunger is even more fundamental or primitive than the sexual urge (*libido*), since feeding is a necessity in all forms of life, while sexual reproduction is not.

Whatever be the underlying mechanisms in the genesis of the hunger urge, in the higher animals this urge is obviously a sensation involving a more or less complex nervous organization. Hunger as a sensation or conscious process is therefore probably confined to animals having a nervous system and an alimentary canal. But all living organisms feed. What, then, are the factors that lead to the ingestion of food in unicellular animals and in the simpler metazoa having no specialized nervous system? And are there any essential connections between these primordial factors that cause the ameba to pursue and engulf another moving protozoan, and the mechanism of the hunger urge compelling a starving wolf to chase, capture, and devour a rabbit?

All the unicellular animals live, at least during their periods of activity, in water, in animal and plant fluids, or within the living cells of other animals. In the case of the simpler organisms that are parasitic the conditions of feeding are essentially those of the tissue cells of the higher animals. That is to say, the food materials are in solution in the medium surrounding the cell or the animal. According to Pütter, this also applies to all lower forms of life