



## Satiety and Weight Control

THE title of this session, "Satiety and Weight Control" is particularly apposite, in that it emphasizes the crucial relevance of the concept of satiety to the problems of overweight. As neurophysiologists, we are of course interested in *hunger* as an essential metabolic and behavioral complex present in all animals endowed with a nervous system. Psychologists are interested in hunger as a "basic" drive. On the other hand, in practice it is *satiety*, rather than hunger which should be the object of our special attention as practical nutritionists concerned with obesity.

There is an obvious reason for this emphasis. Irrespective of the degree of their hunger, modern westerners sit down for meals three times a day. The pattern of the meal is usually pre-set and the main element of choice is in the determination of the size of the portions and the decision as to whether to take second portions. This in turn means that the crucial aspect in controlling intake in our present culture is not the initiation of feeding behavior but its cessation. There are other reasons, however, to emphasize satiety in weight control. Such reasons are physiologic, psychologic, and social. The *physiologic* reasons follow from results expounded elsewhere in this symposium by my co-worker, Dr. Anliker. These indicate to us that the regulation of food intake resides in the application of a brake, sensitive to metabolic influences, of which an essential component is situated in the ventromedial hypothalamic area. This brake slows down or inhibits the operation of a constantly activated feeding mechanism of which a component is probably situated in the lateral hypothalamus. Metabolic influences adjust intake to requirements by acting on the ventromedial area and "modulating," so to speak, this inhibition. Thus what is regulated, in the proper sense of the term, is not hunger, but satiety. To be sure, a number of physiologic and psychologic factors act on the feeding mechanism to inhibit or to facilitate feeding behavior but there is no evidence that such factors are regulatory, i.e., that they contribute to homeostasis.

My associates and I have suggested previously a possible "glucostatic" mechanism for the mediation of the influence of metabolism on the ventromedial area of the hypothalamus. Such a hypothesis is supported by recent work on the specificity of goldthioglucose in causing ventromedial area lesions as well as by the behavioral and physiologic effects of such lesions. It is also supported by the impressive evidence gathered by Dr. Stunkard and his co-workers as regards the action of glucagon and of glucose infusion on gastric hunger contractions and hunger feelings.

A mechanism as complex as the one which recent findings unfold for the regulation of food intake can go wrong in a number of places. All of us have been for a long time familiar with the idea that lack of appetite could be the result of a number of unrelated causes. We are coming around to the idea that the same situation exists as regards hyperphagia. The etiologic points of view can be developed, with consideration of the genetic,

traumatic, and environmental factors in the etiology of obesity. Or the mechanism of the development of obesity—its pathogenesis—may be stressed and one may distinguish between “regulatory” obesities (where the error lies in the central nervous mechanism concerned with satiety and hunger) and “metabolic” obesities (where the primary peripheral abnormalities are followed secondarily by hyperphagia). Among “regulatory” factors, *psychologic* factors are of special importance in the human species. Dr. Charlotte Young, who has been working on the problem of obesity for a considerable time will share some of her observations with us on this point.

Finally there are *social* reasons for the emphasis on satiety. Society brings to bear on the individual a number of important pressures. Advertising is one to which present-day Americans are subjected daily. Popular thinking about food is influenced much more by daily ads, found in all mass media, than by occasional articles or lectures given by nutritionists. For a time, the interests of the food industries coincided almost completely with the viewpoint of public health. It was important to have the population consume a more varied diet and increase its consumption of “protective foodstuffs,” fruits, vegetables, milk, etc. Thus advertising conditioned the public to devote a greater amount of money to the purchase of good sources of minerals and vitamins. With the ever increasing prevalence of overweight and the recognition that certain dietary factors may play a major role in the development of arteriosclerosis, we must re-examine the situation. One cannot consume indefinitely more milk, eggs, meat, etc., and not increase the fat content of the diet. In effect, bacon, fried foods, shortenings, large amounts of refined carbohydrates, etc., have no place in the diet of the overweight person. The relevance of these facts to this symposium is that nowadays the advertising seems directed largely toward, precisely, the importance of satiety feelings in weight control. Refined sugars, fats—the emptiest calories from a nutritional viewpoint—are advertised because of their satiety value. This conflict is reflected in the confused thinking of many obese sufferers who, literally do not know any more what to believe about foods. Nor is this situation eased by the frequently punitive tone of many public-health writers, their half-veiled contempt for the overweight subject, and their refusal to recognize with Dr. Young that obesity is a medical, not a moral problem, requiring understanding, patience, and clarity. An obese patient may already have some idiosyncrasies, but added man-made effects may result in more serious secondary disturbances, if not, as Dr. Stunkard has pointed out elsewhere, in actual iatrogenic syndromes. This unraveling of primary psychiatric traits and of secondary disturbances brought about by social premises is going to be dealt with by our other two speakers. Dr. Hilde Bruch, undoubtedly the outstanding specialist on the psychiatric aspects of obesity, is going to speak on the emotional significance of the preferred weight; and Dr. Robert Suczek, whose work on the psychologic typing of obese subjects has attracted wide attention, will speak on the personality of the obese patient.

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