

THURSDAY, MARCH 15, 1917.

HUNGER AND APPETITE.

- (1) *The Control of Hunger in Health and Disease.* By Anton Julius Carlson. Pp. vii+319. (Chicago: University of Chicago Press; Cambridge: At the University Press, 1916.) Price 9s. net.
- (2) *Food and Health: An Elementary Text-book of Home Making.* By Prof. Helen Kinne and Anna M. Cooley. Pp. vi+312. (The Home-Making Series.) (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1916.) Price 3s. net.

(1) PROF. CARLSON gives, in this volume, a general account of the work done, chiefly in his laboratory, on the physiology of hunger and some related questions. He was fortunate to have as subject of experiment a man who possessed a gastric fistula, made in consequence of an œsophageal stricture when he was a boy. Experiments were also made on Prof. Carlson himself and other normal subjects, as well as on dogs and lower animals.

The net result of the investigation is to show that the sensation of hunger is due to a periodic series of rhythmic contractions, which take place in the stomach when empty. Haller had suggested this cause, but thought that the sensation was produced by the rubbing together of folds of the mucous membrane. Prof. Carlson shows that the sensation has its origin in receptors in the muscle substance itself. The contractions are started in the stomach, although their rhythm is slightly altered after the stomach is separated from the central nervous system. When food is taken the hunger contractions cease for a few minutes, and then the movements of digestion begin. These differ from the hunger contractions, being primarily concerned with the pyloric end, whereas the latter are initiated at the cardiac end and pass as peristaltic waves over the whole stomach. It would seem that the only satisfactory explanation of the digestion contractions is that they are brought about by the central nervous system, the hunger contractions being inhibited for the purpose. This inhibition can be produced by sensations of taste, or by the presence in the stomach of water, gastric juice, acid, alkali, oil, and other things, or in the intestine of gastric juice, acid, or alkali. It is interesting to note that alcohol inhibits hunger, while it may increase appetite. Appetite, in fact, is quite different from hunger, being rather a mental anticipation of pleasant sensations to come. It is, however, more complex than this, as the discussion in Prof. Carlson's book shows. We know that appetite may be present without hunger, and the experience of fasting men is that hunger may be present without appetite.

The nerves that convey the afferent impulses produced by the hunger contractions are the vagi. As already stated, these contractions are not set

into action by any stimuli from the outside, although they can be thus inhibited. The channels of inhibition appear to be chiefly through the splanchnic nerves, but central inhibition of the tone of the vagus centre also plays a part. We find, therefore, a further case of reciprocal innervation of the kind described by the reviewer in vaso-motor reflexes.

Various other questions are elucidated incidentally. The sensibility of the gastric mucous membrane to heat and cold is shown to be a true one, and Head's statement as to its protopathic nature is confirmed.

The want of food, even in protozoa and plants, is manifested by increased excitability and restlessness. In animals this state induces them to take food, because they have learned that food abolishes the feeling.

The book concludes with observations on the secretion and the chemical properties of human gastric juice, and with the discussion of hunger and appetite in disease. As a practical general conclusion we may note that the physiological way of increasing hunger and appetite is moderation in the amount of food taken, or increasing the utilisation of food by outdoor living, fresh air, cold baths, and muscular exercise.

The book is a very valuable and interesting account of a somewhat neglected branch of physiology.

(2) This manual is of a different nature. Although intended primarily for use in schools, it contains a mass of useful information for all concerned with occupations in the home. It is chiefly concerned with the preparation of food, but includes instructions for its preservation, and also for the raising and selling of poultry and so on. The making and properties of bread are described in considerable detail.

The physiological facts are correctly given, and the explanation of the energy value of food and the unit in which it is expressed, the Calorie, is particularly well done. There are, however, one or two surprising omissions. No reference is made to the "accessory factors" of food, or to the misuse of alcohol, although we have a warning against the far less serious misuse of tea and coffee. Perhaps the alcohol question is not so pressing in the United States as with us.

Both books are well provided with illustrations, and contain indexes and references to literature for those who wish to follow up the subject in more detail. Many otherwise excellent works lose much of their value owing to the absence of one or other of these indispensable components.

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THEORETICAL AND PRACTICAL PHYSICS.

- (1) *A Text-book of Physics.* Edited by A. Wilmer Duff. Fourth edition, revised. Pp. xiv+692. (London: J. and A. Churchill, 1916.) Price 10s. 6d. net.
- (2) *Practical Experiments in Heat.* Pp. viii+123.

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